The City of Delray Beach
100 NW 1st Avenue
Delray Beach, FL 33444

PURCHASING DEPARTMENT

INVITATION TO BID
CONSTRUCTION

ITBC NO.: 2017-065-2
TITLE: PHASE 1 OF SEACREST BEAUTIFICATION, PROJECT NO. 17-008 (FORMERLY 14-071), 913-27

DUE DATE AND TIME: September 8, 2017 AT 2:00 PM

INSTRUCTIONS
Sealed Bids must be received on or before the due date and time (local time). All Bids will be publicly opened at City Hall, unless otherwise specified.

Submission of Bids electronically will be through a secure mailbox at BidSync (www.bidsync.com) until the Due Date and Time as indicated in this ITB. BidSync does not accept electronic Bids after the Due Date and Time. It is the sole responsibility of the Bidder to ensure its Bid submission via BidSync is complete prior to the solicitation Due Date and Time. Electronic submission of bids will require the uploading of forms and/or attachments as designated in this ITBC. Electronic submission must include a signed original of the Solicitation Summary form. The submission of forms and attachments containing embedded documents or proprietary file extensions is prohibited. All documents should be attached as separate file.

Bids submitted in hard copy format must be delivered to the City Hall Front Lobby Reception Desk, 100 N.W. 1st Avenue, Delray Beach, Florida 33444. Normal City business hours are 8:00 AM to 5:00 PM, Monday through Friday, except holidays. Hard copy Bid packages shall have the following information clearly marked on the face of the sealed package: Bidder's name, return address, ITBC number, Due Date for submission of Bids, and the title of the Bid. Included in the package shall be one (1) hard copy original clearly identified as the "Original" that includes a signed original of the Solicitation Summary form, one (1) duplicate hard copy, and one (1) electronic version of the Bid on a compact disc (CD) or a Universal Serial Bus (USB) drive in a usable PDF format.

If the Solicitation Summary form is not included, the City may deem the Bid non-responsive. Bids must contain all information required to be included in the submittal, as described in this Solicitation.

BROADCAST
The City of Delray Beach utilizes electronic online services for notification and distribution of its Solicitation documents. The City's Solicitation information can be obtained from: (a) Bid Sync website – www.bidsync.com; (b) Purchasing webpage on the City of Delray Beach website; (c) Email request to purchasing@mydelraybeach.com; (d) in-person request at City Hall.

Bidders who obtain Solicitations from sources other than those named above are cautioned that the Bid package may be incomplete. The City will not evaluate incomplete Bid packages. BidSync is an independent entity and is not agent or representative of the City. Communications to Bid Sync do not constitute communications to the City.

The City is not responsible for errors and omissions occurring in the transmission or downloading of any documents, addenda, plans, or specifications from the websites. In the event of any discrepancy between information on the websites and the Solicitation documents, the terms and conditions of the Solicitation documents will prevail.

CONTACT PERSON

Any questions regarding the specifications and Solicitation process must be submitted in writing to the Purchasing Department at purchasing@mydelraybeach.com or through the "Question" feature on www.bidsync.com. Questions and requests for clarification and additional information must be received prior to the Deadline for Submission of Questions on August 28, 2017.

The City of Delray Beach
100 N.W. 1st Avenue
Delray Beach, FL 33444

LEGAL ADVERTISEMENT

INVITATION TO BID CONSTRUCTION NO. 2017-065-2
PHASE 1 OF SEACREST BEAUTIFICATION

The City of Delray Beach is seeking Bids from qualified Bidders to construct roads, sidewalks, bicycle lanes and crosswalk improvements in accordance with the terms, conditions, and specifications contained in this Invitation to Bid Construction.

Invitation to Bid Construction documents are available beginning August 9, 2017 on the Purchasing webpage on the City of Delray Beach website; on the Bid Sync website – www.bidsync.com; via email request to purchasing@mydelraybeach.com; via hard copy at City Hall.

Submission of Bids electronically will be through a secure mailbox at BidSync (www.bidsync.com) until the Deadline for Submission as indicated in this ITBC. Bids submitted in hard copy format must be clearly marked "INVITATION TO BID CONSTRUCTION NO. 2017-065-2, PHASE 1 OF SEACREST BEAUTIFICATION" and delivered to the City of Delray Beach City Hall front lobby reception desk, 100 NW 1st Ave., Delray Beach, Florida 33444. The Deadline for Submission of Bids is September 8, 2017 at 2:00 PM local time. At that time, the Bids will be publicly opened and read aloud at City Hall. Late Bids will not be accepted and will be returned to the sender unopened**.**

The City will hold a Pre-Bid Conference on August 18, 2017, at Environmental Services, City of Delray Beach, starting promptly at 9:30 AM local time. Attendance is recommended, but not mandatory.

It is the responsibility of the Bidder to ensure all pages are included in the submission. All Bidders are advised to closely examine the Solicitation package. Any questions regarding the completeness or substance of the Solicitation package or scope of services must be submitted in writing via email to purchasing@mydelraybeach.com or by using the "Question" feature on www.bidsync.com.

The City of Delray Beach is exempt from Federal and State Taxes for tangible personal property tax.

The City of Delray Beach reserves the right to accept or reject any or all Bids, in whole or in part, with or without cause, to waive any irregularities and/or technicalities, and to award the contract on such coverage and terms it deems will best serve the interests of the City.

CITY OF DELRAY BEACH

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SECTION 1
GENERAL TERMS AND CONDITIONS

1.1 DEFINITIONS

a. Bid: any offer(s) submitted in response to an Invitation to Bid Construction.

b. Bidder: person or firm submitting a Bid in response to an Invitation to Bid Construction.

c. Bid Solicitation or Invitation to Bid Construction: this Solicitation documentation, including any and all addenda.

d. Bid Submittal Form: describes the goods or services to be purchased, and must be completed and submitted with the Bid.

e. City: shall refer to the City of Delray Beach, Florida.

f. Contract or Agreement: Invitation to Bid Construction, all addenda issued thereto, all affidavits, the signed agreement, and all related documents which comprise the totality of the contract or agreement between the City and the Bidder.

g. Contractor: successful Bidder or Bidder who is awarded a contract to provide goods or services to the City.

h. Invitation to Bid Construction: formal request for Bids from qualified Bidders.

i. Purchasing Department: Purchasing Department of the City of Delray Beach, Florida.

j. Responsible Bidder: Bidder which has the capability in all respects to perform in full the contract requirements, as stated in the Invitation to Bid Construction, and the integrity and reliability that will assure good-faith performance.

k. Responsive Bidder: Bidder whose Bid conforms in all material respects to the terms and conditions included in the Invitation to Bid Construction.

1.2 CONE OF SILENCE

Pursuant to Section 2-355 of Palm Beach County Ordinance No. 2011-039, and the purchasing policies of the City of Delray Beach, all Solicitations, once advertised and until the appropriate authority has approved an award recommendation, are under the "Cone of Silence". This limits and requires documentation of communications between potential Bidders and/or Bidders on City Solicitations, the City's professional staff, and the City Council members.

1.3 ADDENDUM

The Purchasing Department may issue an addendum in response to any inquiry received, prior to the close of the Solicitation period, which changes, adds, or clarifies the terms, provisions, or requirements of the Solicitation. The Bidder should not rely on any representation, statement, or explanation, whether written or verbal, other than those made in the Solicitation document or in the addenda issued. Where there appears to be a conflict between the Solicitation and any addenda, the last addendum issued shall prevail. It is the vendor's responsibility to ensure receipt of all addenda, and any accompanying documentation. The vendor is required to submit with its Bid or Bid a signed "Acknowledgment of Addenda" form, when any addenda have been issued.

1.4 LEGAL REQUIREMENTS

This Solicitation is subject to all legal requirements contained in the applicable City Ordinances and Resolutions, as well as all applicable City, State, and Federal Statutes. Where conflict exists between this Bid Solicitation and these legal requirements, the authority shall prevail in the following order: Federal, State, and local.

1.5 CHANGE OF BID

Prior to the scheduled Bid opening a Bidder may change its Bid by submitting a new Bid (as indicated on the cover page) with a letter on the firm's letterhead, signed by an authorized agent stating that the new submittal replaces the original submittal. The new submittal shall contain the letter and all information as required for submitting the original Bid. No changes to a Bid will be accepted after the Bid has been opened.

1.6 WITHDRAWAL OF BID

A Bid shall be irrevocable unless the Bid is withdrawn as provided herein. Only a written letter received by the Purchasing Department prior to the Bid opening date may withdraw a Bid. A Bid may also be withdrawn ninety (90) days after the Bid has been opened and prior to award, by submitting a letter to the Purchasing and Contracts Director. The withdrawal letter must be on company letterhead and signed by an authorized agent of the Bidder.

1.7 CONFLICTS WITHIN THE BID SOLICITATION

Where there appears to be a conflict between the General Terms and Conditions, Special Conditions, the Technical Specifications, the Bid Submittal Form, or any addendum issued, the order of precedence shall be: the last addendum issued, the Bid Submittal Form, the Technical Specifications, the Special Conditions, and then the General Terms and Conditions.

1.8 PROMPT PAYMENT TERMS

It is the policy of the City of Delray Beach that payment for all purchases by City departments shall be made in a timely manner. The City will pay the awarded Bidder upon receipt and acceptance of the goods or services by a duly authorized representative of the City. In accordance with Section 218.74, Florida Statutes, the time at which payment shall be

due from the City shall be forty-five (45) days from receipt of a proper invoice. The time at which payment shall be due to small businesses shall be thirty (30) days from receipt of a proper invoice. Proceedings to resolve disputes for payment of obligations shall be concluded by final written decision of the City Manager or designee, not later than sixty (60) days after the date on which the proper invoice was received by the City.

1.9 DISCOUNTS (PROMPT PAYMENTS)

The Bidder may offer cash discounts for prompt payments; however, such discounts will not be considered in determining the lowest price during Bid evaluation. Bidders are requested to provide prompt payment terms in the space provided on the Bid submittal signature page of the Solicitation.

1.10 PREPARATION OF BIDS

a. The Bid forms define requirements of items to be purchased, and must be completed and submitted with the Bid. Use of any other forms will result in the rejection of the Bidder's offer. The Bid submittal forms must be legible. Bidders shall use typewriter, computer, or ink. All changes must be crossed out and initialed in ink. Failure to comply with these requirements may cause the Bid to be rejected.

b. An authorized agent of the Bidder's firm must sign the Bid submittal form. **Failure to sign the Signature Page of the Bid shall render the Bid non-responsive.**

c. The Bidder may be considered non-responsive if Bids are conditioned upon modifications, changes, or revisions to the terms and conditions of this Solicitation.

d. The Bidder may submit alternate Bid(s) for the same Solicitation provided that such offer is allowable under the terms and conditions. The alternate Bid must meet or exceed the minimum requirements and be submitted as a separate Bid submittal marked "Alternate Bid".

e. When there is a discrepancy between the unit prices and any extended prices, the unit prices will prevail.

f. Late Bids will not be accepted and will be returned to the sender unopened. It is the Bidder's responsibility to ensure timely delivery by the due date and time, and at the place stated in this Solicitation. No exceptions will be made due to weather, carrier, traffic, illness, or other issues.

1.11 CANCELLATION OF BID SOLICITATION

The City of Delray Beach reserves the right to cancel, in whole or in part, any Invitation to Bid Construction when it is in the best interest of the City.

1.12 AWARD OF CONTRACT

a. The contract may be awarded to the responsive and responsible Bidder meeting all requirements as set forth in the Solicitation. The City reserves the right to reject any and all Bids, to waive irregularities or technicalities, and to re-advertise for all or any part of this Bid Solicitation as deemed in its best interest. The City shall be the sole judge of its best interest.

b. The City reserves the right to reject any and all Bids if it is determined that prices are excessive, best offers are determined to be unreasonable, or it is otherwise determined to be in the City's best interest to do so.

c. The City reserves the right to negotiate prices **with the responsive and responsible low Bidder**, provided that the scope of work of this Solicitation remains the same.

d. The Bidder's performance as a prime contractor or subcontractor on previous City contracts shall be taken into account in evaluating the Bid received for this Bid Solicitation.

e. The City will provide a copy of the Bid Tabulation to all Bidders responding to this Solicitation.

f. The Bid Solicitation, any addenda and/or properly executed modifications, the signed Agreement, the purchase order, and any change order(s) shall constitute the contract.

g. The Purchasing Director will decide all tie Bids.

h. Award of this Bid may be predicated on compliance with and submittal of all required documents as stipulated in the Bid Solicitation.

i. The City reserves the right to request and evaluate additional information from any Bidder after the submission deadline as the City deems necessary.

1.13 CONTRACT EXTENSION

The City reserves the right to automatically extend any agreement for a maximum period not to exceed ninety (90) calendar days in order to provide City departments with continual service and supplies while a new agreement is being solicited, evaluated, and/or awarded.

1.14 WARRANTY

All warranties express and implied shall be made available to the City for goods and services covered by this Bid Solicitation. All goods furnished shall be fully guaranteed by the awarded Bidder against factory defects and workmanship. At no expense to the City, the awarded Bidder shall correct any and all apparent and latent defects that may occur within the manufacturer's standard warranty.

1.15 ESTIMATED QUANTITIES

Estimated quantities or dollars are for Bidder's guidance only: (a) estimates are based on the City's anticipated needs and/or usage; and (b) the City may use these estimates to determine the low Bidder. No guarantee is expressed or implied as to quantities or dollars that will be used during the contract period. The City is not obligated to place any order for the given amount subsequent to the award of this Bid Solicitation.

1.16 NON-EXCLUSIVITY

It is the intent of the City to enter into an agreement with the awarded Bidder that will satisfy its needs as described herein. However, the City reserves the right as deemed in its best interest to perform, or cause to be performed, the work and services, or any portion thereof, herein described in any manner it sees fit, including but not limited to, award of other contracts, use of any contractor, or perform the work with its own employees.

1.17 CONTINUATION OF WORK

Any work that commences prior to and will extend beyond the expiration date of the current contract period shall, unless terminated by mutual written agreement between the City and the successful Bidder, continue until completion at the same prices, terms, and conditions.

1.18 BID PROTEST

A recommendation for contract award or rejection of award may be protested by a Bidder. The Bidder may file a written protest with the City Clerk's office. The Bidder shall file its written protest with the City Clerk, Monday through Friday, between the hours of 8:00 AM and 5:00 PM, excluding legal holidays. Protests shall contain the name, address, and phone number of the petitioner, name of the petitioner's representative (if any), and the title and Bid number of the Solicitation. The protest shall specifically describe the subject matter, facts giving rise to the protest, and the action requested from the City.

The written protest must be received no later than seventy-two (72) consecutive hours (excluding Saturdays, Sundays, and legal holidays) after the time of award posting. Failure to file a timely formal written protest within the time period specified shall constitute a waiver by the Bidder of all rights of protest.

In the event of a timely protest, the City will not proceed further with award of the contract and agreement until all administrative remedies are exhausted, or until the City Manager determines the award of the contract is immediately necessary to protect the public health, welfare, or safety.

1.19 LAWS AND REGULATIONS

The awarded Bidder shall comply with all laws and regulations applicable to provide the goods or services specified in this Bid Solicitation. The Bidder shall be familiar with all federal, state, and local laws that may affect the goods and/or services offered.

1.20 LICENSES, PERMITS AND FEES

The awarded Bidder(s) shall hold all licenses and/or certifications, obtain and pay for all permits and/or inspections, and comply with all laws, ordinances, regulations, and building code requirements applicable to the work required herein. Damages, penalties, and/or fines imposed on the City or an awarded Bidder for failure to obtain and maintain required licenses, certifications, permits, and/or inspections shall be borne by the awarded Bidder.

1.21 SUBCONTRACTING

Unless otherwise specified in this Bid Solicitation, the successful Bidder shall not subcontract any portion of the work without the prior written consent of the City. The ability to subcontract may be further limited by the Special Conditions. Subcontracting without the prior consent of the City may result in termination of the contract for default.

1.22 ASSIGNMENT

The awarded Bidder shall not assign, transfer, hypothecate, or otherwise dispose of this contract, including any rights, title, or interest therein, or its power to execute such contract to any person, company, or corporation without the prior written consent of the City. Assignment without the prior consent of the City may result in termination of the contract for default.

1.23 SHIPPING TERMS

Unless otherwise specified in the Bid Solicitation, prices quoted shall be F.O.B. Destination. Freight shall be included in the proposed price.

1.24 RESPONSIBILITIES AS EMPLOYER

The employee(s) of the awarded Bidder shall be considered to be at all times its employee(s), and not an employee(s) or agent(s) of the City or any of its departments. The awarded Bidder shall provide physically competent employee(s) capable of performing the work as required. The City may require the awarded Bidder to remove any employee it deems unacceptable. All employees of the awarded Bidder shall wear proper identification.

It is the awarded Bidder's responsibility to ensure that all its employees and subcontractors comply with the employment regulations required by the US Department of Homeland Security. The City shall have no responsibility to check or verify the legal immigration status of any employee of the awarded Bidder.

1.25 INDEMNIFICATION

The awarded Bidder shall indemnify and hold harmless the City and its officers, employees, agents, and instrumentalities from any and all liability, losses or damages, including attorney's fees and costs of defense,

which the City or its officers, employees, agents, or instrumentalities may incur as a result of claims, demands, suits, causes of actions, or proceedings of any kind or nature arising out of, relating to, or resulting from the performance of the agreement by the awarded Bidder or its employees, agents, servants, partners, principals, or subcontractors. The awarded Bidder shall pay all claims and losses in connection therewith, and shall investigate and defend all claims, suits, or actions of any kind or nature in the name of the City, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may be incurred thereon. The awarded Bidder expressly understands and agrees that any insurance protection required by this contract agreement or otherwise provided by the awarded Bidder shall in no way limit the responsibility to indemnify, keep and save harmless, and defend the City or its officers, employees, agents, and instrumentalities as herein provided.

1.26 COLLUSION

A Bidder recommended for award as the result of a competitive Solicitation for any City purchases of supplies, materials, and services (including professional services, other than professional architectural, engineering, and other services subject to Sec. 287.055 Florida Stats.), purchase, lease, permit, concession, or management agreement shall, within five (5) business days of the filing of such recommendation, submit an affidavit under the penalty of perjury, on a form provided by the City, stating either that the contractor is not related to any of the other parties Bidding in the competitive Solicitation or identifying all related parties, as defined in this Section, which Bid in the Solicitation; and attesting that the contractor's Bid is genuine and not a sham or collusive or made in the interest or on behalf of any person not therein named, and that the contractor has not, directly or indirectly, induced or solicited any other Bidder to put in a sham Bid, or any other person, firm, or corporation to refrain from proposing, and that the Bidder has not in any manner sought by collusion to secure to the Bidder an advantage over any other Bidder. In the event a recommended Bidder identifies related parties in the competitive Solicitation its Bid shall be presumed to be collusive and the recommended Bidder shall be ineligible for award unless that presumption is rebutted to the satisfaction of the City. Any person or entity that fails to submit the required affidavit shall be ineligible for contract award.

1.27 MODIFICATION OF CONTRACT

The contract may be modified by mutual consent, in writing, through the issuance of a modification to the contract, a supplemental agreement, purchase order, or change order, as appropriate.

1.28 TERMINATION FOR CONVENIENCE

The City, at its sole discretion, reserves the right to terminate any contract entered into pursuant to this Invitation to Bid Construction (ITBC) with or without cause immediately upon providing written notice to the awarded Bidder. Upon receipt of such notice, the awarded Bidder shall not incur any additional costs under the contract. The City shall be liable only for reasonable costs incurred by the awarded Bidder prior to the date of the notice of termination. The City shall be the sole judge of "reasonable costs."

1.29 TERMINATION FOR DEFAULT

The City reserves the right to terminate this contract, in part or in whole, or place the vendor on probation in the event the awarded Bidder fails to perform in accordance with the terms and conditions stated herein by providing written notice of such failure or default and by specifying a reasonable time period within which the awarded Bidder must cure any such failure to perform or default. If the awarded Bidder fails to cure the default within the time specified, the City may then terminate the subject contract by providing written notice to the awarded Bidder. The City further reserves the right to suspend or debar the awarded Bidder in accordance with the appropriate City ordinances, resolutions, and/or policies. The vendor will be notified by letter of the City's intent to terminate. In the event of termination for default, the City may procure the required goods and/or services from any source and use any method deemed in its best interest. All re-procurement costs shall be borne by the incumbent Bidder.

1.30 FRAUD AND MISREPRESENTATION

Any individual, corporation, or other entity that attempts to meet its contractual obligations with the City through fraud, misrepresentation, or material misstatement, may be debarred for up to five (5) years. The City, as a further sanction, may terminate or cancel any other contracts with such individual, corporation, or entity. Such individual or entity shall be responsible for all direct or indirect costs associated with termination or cancellation, including attorney's fees.

1.31 ACCESS AND AUDIT OF RECORDS

The City reserves the right to require the awarded Bidder to submit to an audit by an auditor of the City's choosing at the awarded Bidder's expense. The awarded Bidder shall provide access to all of its records, which relate directly or indirectly to this Agreement, at its place of business during regular business hours. The awarded Bidder shall retain all records pertaining to this Agreement, and upon request, make them available to the City for three (3) years following expiration of the Agreement. The awarded Bidder agrees to provide such assistance as may be necessary to facilitate the review or audit by the City to ensure compliance with applicable accounting and financial standards.

1.32 OFFICE OF THE INSPECTOR GENERAL

Palm Beach County has established the Office of the Inspector General, which is authorized and empowered to review past, present, and proposed County programs, contracts, transactions, accounts and records. The Inspector

General (IG) has the power to subpoena witnesses, administer oaths, require the production of records, and monitor existing projects and programs. The Inspector General may, on a random basis, perform audits on all City contracts.

1.33 PRE-AWARD INSPECTION

The City may conduct a pre-award inspection of the Bidder's site or hold a pre-award qualification hearing to determine if the Bidder is capable of performing the requirements of this Bid Solicitation.

1.34 PROPRIETARY AND/OR CONFIDENTIAL INFORMATION

Bidders are hereby notified that all information submitted as part of, or in support of Bid submittals will be available for public inspection after the opening of Bids in compliance with Chapter 119 of the Florida Statutes, popularly known as the "Public Record Law." The Bidder shall not submit any information in response to this Solicitation which the Bidder considers to be a trade secret, proprietary, or confidential. The submission of any information to the City in connection with this Solicitation shall be deemed conclusively to be a waiver of any trade secret or other protection which would otherwise be available to the Bidder. In the event that the Bidder submits information to the City in violation of this restriction, either inadvertently or intentionally, and clearly identifies that information in the Bid as protected or confidential, the City may, in its sole discretion, either (a) communicate with the Bidder in writing in an effort to obtain the Bidder's withdrawal of the confidentiality restriction, or (b) endeavor to redact and return that information to the Bidder as quickly as possible, and if appropriate, evaluate the balance of the Bid. The redaction or return of information pursuant to this clause may render a Bid non-responsive.

1.35 HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)

Any person or entity that performs or assists the City of Delray Beach with a function or activity involving the use or disclosure of "individually identifiable health information (IIHI) and/or Protected Health Information (PHI) shall comply with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. HIPAA mandates for privacy, security, and electronic transfer standards include, but are not limited to:

a. Use of information only for performing services required by the contract or as required by law;

b. Use of appropriate safeguards to prevent non-permitted disclosures;

c. Reporting to the City of Delray Beach any non-permitted use or disclosure;

d. Assurances that any agents and subcontractors agree to the same restrictions and conditions that apply to the Bidder and reasonable assurances that IIHI/PHI will be held confidential;

e. Making Protected Health Information (PHI) available to the customer;

f. Making PHI available to the customer for review and amendment, and incorporating any amendments requested by the customer;

g. Making PHI available to the City of Delray Beach for an accounting of disclosures; and

h. Making internal practices, books, and records related to PHI available to the City of Delray Beach for compliance audits.

PHI shall maintain its protected status regardless of the form and method of transmission (paper records and/or electronic transfer of data). The Bidder must give its customers written notice of its privacy information practices, including specifically, a description of the types of uses and disclosures that would be made with protected health information.

1.36 ADDITIONAL FEES AND SURCHARGES

Unless provided for in the contract/agreement, the City will not make any additional payments such as fuel surcharges, demurrage fees, or delay-in-delivery charges.

1.37 COMPLIANCE WITH FEDERAL STANDARDS

All items to be purchased under this contract shall be in accordance with all governmental standards, to include, but not be limited to, those issued by the Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety Hazards (NIOSH), and the National Fire Protection Association (NFPA).

1.38 COMPLIANCE WITH FEDERAL REGULATIONS DUE TO USE OF FEDERAL FUNDING

If the goods or services to be acquired under this Solicitation are to be purchased, in part or in whole, with Federal funding, it is hereby agreed and understood that Section 60-250.4, Section 60-250.5, and Section 60-741.4 of Title 41 of the United States Code, which addresses Affirmative Action requirements for disabled workers, is incorporated into this Solicitation and resultant contract by reference.

1.39 BINDING EFFECT

All of the terms and provisions of this contract/agreement, whether so expressed or not, shall be binding upon, inure to the benefit of, and be enforceable by the parties and their respective legal representatives, successors, and permitted assigns.

1.40 SEVERABILITY

The City's obligation pursuant to any contract or agreement entered into in accordance with this Solicitation is

specifically contingent upon the lawful appropriation of funds. Failure to lawfully appropriate funds for any contract or agreement awarded shall result in automatic termination of the contract or agreement. A non-appropriation event shall not constitute a default or breach of said contract or agreement by the City.

1.41 GOVERNING LAW AND VENUE

This contract and all transactions contemplated by this agreement shall be governed by and construed and enforced in accordance with the laws of the State of Florida without regard to any contrary conflicts of law principle. Venue of all proceedings in connection herewith shall lie exclusively in Palm Beach County, Florida, and each party hereby waives whatever its respective rights may have been in the selection of venue.

1.42 ATTORNEY'S FEES

It is hereby understood and agreed that in the event any lawsuit in the judicial system, federal or state, is brought to enforce compliance with this contract or interpret same, or if any administrative proceeding is brought for the same purposes, each party shall pay their own attorney's fees and costs, including appellate fees and costs.

1.43 EQUAL OPPORTUNITY AND ANTI-DISCRIMINATION

The City of Delray Beach complies with all laws prohibiting discrimination on the basis of age, race, gender, religion, creed, political affiliation, sexual orientation, physical or mental disability, color or national origin, and therefore is committed to assuring equal opportunity in the award of contracts and encourages small, local, minority, and female-owned businesses to participate.

During the performance of this contract, the awarded Bidder agrees it will not discriminate or permit discrimination in its hiring practices or in its performance of the contract. The awarded Bidder shall strictly adhere to the equal employment opportunity requirements and any applicable requirements established by the State of Florida, Palm Beach County and the federal government.

The awarded Bidder further acknowledges and agrees to provide the City with all information and documentation that may be requested by the City from time to time regarding the Solicitation, selection, treatment and payment of subcontractors, suppliers, and vendors in connection with this Contract.

1.44 AVAILABILITY OF CONTRACT TO OTHER CITY DEPARTMENTS

It is agreed and understood that any City department or agency may access this contract and purchase the goods or services awarded herein. Each City department will issue a separate purchase order to the awarded Bidder for the department's specific purchases.

1.45 CRIMINAL HISTORY BACKGROUND CHECKS

Prior to hiring a contract employee or contracting with a Bidder, the City may conduct a comprehensive criminal background check by accessing any Federal, State, or local law enforcement database available. The contract employee or Bidder will be required to sign an authorization for the City to access criminal background information. The costs for the background checks shall be borne by the City.

1.46 LABOR, MATERIALS, AND EQUIPMENT

Unless specified elsewhere in the Solicitation or resultant contract, all labor, materials, and equipment required for the performance of the requirements of the Contract shall be supplied by the awarded Bidder.

1.47 MINIMUM WAGE REQUIREMENTS

The awarded Bidder shall comply with all minimum wage and living wage requirements, such as Living Wage requirements, minimum wages based on Federal Law, minimum wages based on the Davis-Bacon Act, and the provisions of any other wages laws, as may be applicable to this Contract.

1.48 PACKING SLIP AND DELIVERY TICKET

A packing slip and/or delivery ticket shall accompany all items during delivery to the City. The documents shall include information on the contract number or purchase order, any back order items, and the number or quantity of items being delivered.

1.49 PURCHASE OF OTHER ITEMS

The City reserves the right to purchase other related goods or services, not listed in the Solicitation, during the contract term. When such requirements are identified, the City may request price quote(s) from the awarded Bidder(s) on the contract. The City, at its sole discretion, will determine if the prices offered are reasonable, and may choose to purchase the goods or services from the awarded Bidder, another contract vendor, or a non-contract vendor.

1.50 PUBLIC RECORDS

Florida law provides that municipal records shall at all times be available to the public for inspection. Chapter 119, Florida Statutes, the Public Records Law, requires that all material submitted in connection with a Bid response shall be deemed to be public record subject to public inspection upon award, recommendation for award, or thirty (30) days after Bid opening, whichever occurs first. Certain exemptions to public disclosure are statutorily provided for in Section 119.07, Florida Statutes. If the Bidder believes any of the information contained in his/her/its Bid is considered confidential and/or proprietary, inclusive of trade secrets as defined in Section 812.081, Florida Statutes, and is exempt from the Public Records Law, then the Bidder, must in its response, specifically identify the material which is deemed to be exempt and state the legal authority for the exemption. All materials that qualify for exemption from Chapter 119, Florida Statutes or other applicable law must be submitted in a separate envelope, clearly identified as "EXEMPT FROM PUBLIC DISCLOSURE" with the firm's name and the Bid number clearly marked on the outside. The City

will not accept Bids when the entire Bid is labeled as exempt from disclosure. The City's determination of whether an exemption applies shall be final, and the Bidder agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records.

The awarded Bidder(s) shall keep and maintain public records and fully comply with the requirements set forth at Section 119.0701, Florida Statues, as applicable; failure to do so shall constitute a material breach of any and all agreements awarded pursuant to this Solicitation.

1.51 CONFLICTS OF INTEREST

All Bidders must disclose with their Bid the name of any officer, director, or agent who is also an employee of the City of Delray Beach. Further, all Bidders must disclose the name of any City employee who has any interest, financial or otherwise, direct or indirect, of five percent (5%) or more in the Bidders' firm or any of its branches. Failure to disclose any such affiliation will result in disqualification of the Bidder from this Invitation to Bid Construction and may be grounds for further disqualification from participating in any future Bids with the City.

1.52 PUBLIC ENTITY CRIMES

As provided in Section 287.133(2) (a), Florida Statutes, a person or affiliate who has been placed on the convicted vendors list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity; may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit Bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity.

1.53 OTHER GOVERNMENTAL AGENCIES

If a Bidder is awarded a contract as a result of this ITBC, the Bidder shall allow other governmental agencies to access this contract and purchase the goods and services under the terms and conditions at the prices awarded, as applicable.

1.54 COMPLETION OF WORK AND DELIVERY

All work shall be performed and all deliveries made in accordance with good commercial practice. The work schedule and completion dates shall be adhered to by the awarded Bidder(s), except in such cases where the completion date will be delayed due to acts of nature, force majeure, strikes, or other causes beyond the control of the awarded Bidder. In these cases, the awarded Bidder shall notify the City of the delays in advance of the original completion so that a revised delivery schedule can be appropriately considered by the City.

1.55 FAILURE TO DELIVER OR COMPLETE WORK

Should the awarded Bidder(s) fail to deliver or complete the work within the time stated in the contract, it is hereby agreed and understood that the City reserves the authority to cancel the contract with the awarded Bidder and secure the services of another vendor to purchase the items or complete the work. If the City exercises this authority, the City shall be responsible for reimbursing the awarded Bidder for work that was completed, and items delivered and accepted by the City in accordance with the contract specifications. The City may, at its option, demand payment from the awarded Bidder, through an invoice or credit memo, for any additional costs over and beyond the original contract price which were incurred by the City as a result of having to secure the services of another vendor.

1.56 CORRECTING DEFECTS

The awarded Bidder shall be responsible for promptly correcting any deficiency, at no cost to the City, within three (3) calendar days after the City notifies the awarded Bidder of such deficiency in writing. If the awarded Bidder fails to correct the defect, the City may (a) place the awarded Bidder in default of its contract; and/or (b) procure the products or services from another source and charge the awarded Bidder for any additional costs that are incurred by the City for this work or items, either through a credit memorandum or through invoicing.

1.57 ACCIDENT PREVENTION AND BARRICADES

Precautions shall be exercised at all times for the protection of persons and property. All awarded Bidders performing services or delivering goods under this contract shall conform to all relevant OSHA, State, and County regulations during the course of such effort. Any fines levied by the above-mentioned authorities for failure to comply with these requirements shall be borne solely by the awarded Bidder. Barricades shall be provided by the awarded Bidder when work is performed in areas traversed by persons, or when deemed necessary by the City.

1.58 OMISSIONS IN SPECIFICATIONS

The specifications and/or statement of work contained within this Solicitation describe the various functions and classes of work required as necessary for the completion of the project. Any omissions of inherent technical functions or classes of work within the specifications and/or statement of work shall not relieve the Bidder from furnishing, installing, or performing such work where required to the satisfactory completion of the project.

1.59 MATERIALS SHALL BE NEW AND WARRANTED AGAINST DEFECTS

The awarded Bidder hereby acknowledges and agrees that all materials, except where recycled content is specifically requested, supplied by the awarded Bidder in conjunction with this Solicitation and resultant contract shall be new, warranted for their merchantability, and fit for a particular purpose. In the event any of the materials supplied to the

City by the awarded Bidder are found to be defective or do not conform to specifications, (1) the materials may be returned to the awarded Bidder at the Bidder's expense and the contract cancelled; or (2) the City may require the awarded Bidder to replace the materials at the Bidder's expense.

1.60 TOXIC SUBSTANCES/FEDERAL "RIGHT TO KNOW" REGULATIONS

The Federal "Right to Know" Regulation implemented by the Occupational Safety and Health Administration (OSHA) requires employers to inform their employees of any toxic substances to which they may be exposed in the workplace, and to provide training in safe handling practices and emergency procedures. It also requires notification to local fire departments of the location and characteristics of all toxic substances regularly present in the workplace.

Accordingly, the awarded Bidder(s) performing under this contract are required to provide two (2) complete sets of Material Safety Data Sheets to each City department utilizing the any awarded products that are subject to these regulations. This information should be provided at the time when the initial delivery is made, on a department-by-department basis.

1.61 TAXES

The City of Delray Beach is exempt from Federal and State taxes for tangible personal property.

1.62 BIDDER'S COSTS

The City shall not be liable for any costs incurred by Bidders in responding to this Invitation to Bid Construction.

1.63 SUBSTITUTION OF PERSONNEL

It is the intention of the City that the awarded Bidder's personnel proposed for the contract shall be available for the initial contract term. In the event the awarded Bidder wishes to substitute personnel, the awarded Bidder shall propose personnel of equal or higher qualifications, and all replacement personnel are subject to the City's approval. In the event the substitute personnel are not satisfactory to the City, and the matter cannot be resolved to the satisfaction of the City, the City reserves the right to cancel the contract for cause.

1.64 FORCE MAJEURE

The City and the awarded Bidder are excused from the performance of their respective obligations under the contract when and to the extent that their performance is delayed or prevented by any circumstances beyond their control, including fire, flood, explosion, strikes or other labor disputes, natural disasters, public emergency, war, riot, civil commotion, malicious damage, act or omission of any governmental authority, delay or failure or shortage of any type of transportation, equipment, or service from a public utility needed for their performance provided that:

a. The non-performing party gives the other party prompt written notice describing the particulars of the force majeure, including, but not limited to, the nature of the occurrence and its expected duration, and continues to furnish timely reports with respect thereto during the period of the force majeure.
b. The excuse of performance is of no greater scope and of no longer duration than is required by the force majeure.

c. No obligations of either party that arose before the force majeure causing the excuse of performance are excused as a result of the force majeure.

d. The non-performing party uses its best efforts to remedy its inability to perform.

Notwithstanding the above, performance shall not be excused under this section for a period in excess of two (2) months, provided that in extenuating circumstances, the City may excuse performance for a longer term. Economic hardship of the awarded Bidder shall not constitute a force majeure. The term of the contract shall be extended by a period equal to that during which either party's performance is suspended under this section.

1.65 NOTICES

Notices shall be effective when received at the addresses specified in the contract/agreement. Changes in respective addresses to which such notices are to be directed may be made from time to time by either party by written notice to the other party. Facsimile and email transmissions are acceptable notice effective when received; however, facsimile and email transmissions received after 5:00 PM or on weekends or holidays will be deemed received on the next business day. The original of the notice must also be mailed to the receiving party.

Nothing contained in this section shall be construed to restrict the transmission of routine communications between representatives of the successful Proposer and the City of Delray Beach.

1.66 POOL CONTRACTS

During the term of contracts and agreements that are executed as vendor pools, awarding vendors in prequalified pools of vendors, either as a general pool or by categories, sub-categories, or groups, the City reserves the right to add new vendors to these contracts for goods or services not awarded for the original Solicitation or as part of the general pool category, sub-category or group. To be eligible to be added to these pool contracts, a vendor must meet the same eligibility requirements established in the original Invitation to Bid Construction.

1.67 FISCAL FUNDING OUT

The City's obligation pursuant to any contract or agreement entered into in accordance with this Solicitation is specifically contingent upon the lawful appropriation of funds. Failure to lawfully appropriate funds for any contract or agreement awarded shall result in automatic termination of the contract or agreement.

END OF SECTION 1

SECTION 2
SPECIAL TERMS AND CONDITIONS

2.1 PURPOSE

The purpose of this Solicitation is to establish a contract for the construction of roads, sidewalks, bicycle lanes and crosswalk improvements, in accordance with the terms, conditions, and specifications contained in this Invitation to Bid Construction.

2.2 CONTRACT MEASURES AND PREFERENCES

Intentionally Omitted

2.3 PRE-BID CONFERENCE AND SITE VISIT

The City will hold a Non-Mandatory Pre-Bid Conference on August 18, 2017, starting promptly at 9:30 AM local time, at Environmental Services, 434 South Swinton Avenue, Delray Beach, FL 33444. The City will not conduct a site visit for this solicitation.

Potential Bidders should bring a copy of this Solicitation with them to the Pre-Bid Conference. Bidders will be allowed to ask questions and obtain information on important aspects of this Solicitation.

The purpose of the Pre-Bid Conference is to provide and obtain information relative to the scope, purpose, nature, and extent of the work, and any local conditions, which may affect the performance of work. Submission of a Bid shall constitute an acknowledgement by the Bidder that it has thoroughly examined and is familiar with the requirements of this Solicitation package. The failure or neglect of the Bidder to examine the Solicitation package shall in no way relieve the Bidder of any obligation with respect to its Bid or the requirements of the Contract. No claim for additional compensation will be allowed which is based on a lack of knowledge of the requirements of this Solicitation package or the resultant Contract.

2.4 UPON COMPLETION

The Contract shall commence upon the date of the duly executed Agreement, and shall remain in effect until such time as the commodities, equipment and/or services acquired in conjunction with this Invitation to Bid Construction, have been completed and accepted by the City's authorized representative and upon completion of the expressed and/or implied warranty periods.

2.5 OPTIONS TO RENEW

Intentionally Omitted

2.6 METHOD OF AWARD: LOWEST PRICE

The City will award this contract to the responsive and responsible Bidder who submits the lowest price to perform the work, based on the option (Alternates) selected by the City.

2.7 PRICES SHALL BE FIXED AND FIRM

If the Bidder is awarded a contract under this Solicitation, the prices offered by the Bidder shall remain fixed and firm during the performance of the Work.

2.8 PRICE ADJUSTMENTS
Intentionally Omitted

2.9 EXAMINATION OF CITY FACILITIES OR EQUIPMENT
Prior to submitting its offer, it is recommended that the Bidder visit the site of the proposed work and become familiar with any conditions which may in any manner affect the work to be done or affect the equipment, materials and labor required. The Bidder is also advised to examine carefully any drawings, specifications, or equipment, and become thoroughly aware regarding any and all conditions and requirements that may in any manner affect the work to be performed under the Contract. No additional allowances will be made because of lack of knowledge of these conditions.

2.10 EQUAL PRODUCTS
Intentionally Omitted

2.11 LIQUIDATED DAMAGES
Time is of the essence regarding this Invitation to Bid Construction and the work contemplated hereunder and the City may suffer financial loss and inconvenience if the work is not completed to the satisfaction of the City by the time stipulated in the Contract. Therefore, failure to timely complete the work shall result in the awarded Bidder being subject to liquidated damages, but not as penalty, in the amount of amount of 1% of the Total Contract Price or as set forth in Section 8-10.2, FDOT Standard Specifications, whichever is greater for each and every calendar day the work remains incomplete or the items remain undelivered. As compensation due the City for loss of use and for additional costs incurred by the City due to such non-completion of the work, the City shall have the right to deduct the liquidated damages from any amount due, or that may become due to the awarded Bidder under the Contract, or to invoice the awarded Bidder for such damages if the costs incurred exceed the amount due to the awarded Bidder. The awarded Bidder and the City agree that the amount for liquidated damages is not punitive, and is intended to compensate the City for difficult to quantify losses.

2.12 INSURANCE
The awarded Bidder shall not commence any performance pursuant to the terms of this Solicitation until certification or proof of insurance has been received by the Purchasing Department and approved by the City's Risk Management Division.

The required insurance coverage is to be issued by an insurance company authorized and licensed to do business in the State of Florida, with the minimum rating of A- VIII or better, in accordance with the latest edition of A.M. Best's Insurance Guide. This insurance shall be documented in certificates of insurance which provides that the City of Delray Beach shall be notified at least thirty (30) days in advance of cancellation, non-renewal, or adverse change. The receipt of certificates or other documentation of insurance or policies or copies of policies by the City or by any of its representatives, which indicate less coverage than is required, does not constitute a waiver of the awarded Bidder's obligation to fulfill the insurance requirements herein. Deductibles must be acceptable to the City of Delray Beach.

The awarded Bidder must submit a current Certificate of Insurance, naming the City of Delray Beach as an additional insured and list as such on the insurance certificate. New certificates of insurance are to be provided to the City upon expiration.

The awarded Bidder shall provide insurance coverage as follows, and shall carry:

a. Workers' Compensation Insurance – as required by law.

b. Employer's Liability Insurance - $1,000,000 per occurrence, $1,000,000 for each disease, and $1,000,000 for aggregate disease

c. Comprehensive General Liability Insurance – with limits of not less than $1,000,000 per occurrence and $2,000,000 in the aggregate for Bodily Injury and Property Damage which must include:
   i. Premises and/or Operations on an occurrence basis.
   ii. Independent contractors.
   iii. Products and/or Completed Operations Liability on an occurrence basis.
   iv. Explosion, Collapse, and Underground Coverages.
   v. Broad Form Property Damage.
   vi. Broad Form Contractual Coverage applicable to this specific Agreement, including any hold harmless and/or indemnification agreement.
   vii. Personal Injury Coverage with Employees and Contractual Exclusions removed with minimum limits of coverage equal to those required for Bodily Injury Liability and Property Damage Liability.

d. Builders Risk / Installation Floater – The awarded Bidder shall take out and maintain, as applicable, during the life of this Contract, "all risk" type builders risk insurance satisfactory to the City for the completed value of the Project, which shall protect the awarded Bidder and the City as their interests may appear, for the following hazards to the work, encompassing structures in the course of construction, including foundations, additions, attachments and all permanent fixtures belonging to and constituting a part of said structures, as well as materials and equipment suitably stored at the site and awarded Bidder's construction equipment, materials, and temporary structures:
   i. Fire and lightning, vandalism, and malicious mischief
   ii. Extended coverage including windstorm, hail, flood, explosion, riot, civil commotion, aircraft, vehicle, and smoke damage

e. Professional Liability – To include coverage for contractor pollution exposure, with minimum limits of $1,000,000 per claim and in the aggregate.

f. Business Automobile Liability – With minimum limits of $1,000,000 per occurrence combined single limit for Bodily Injury Liability and Property Damage Liability. Coverage must be afforded on a form no more restrictive than the latest edition of the Business Automobile Liability Policy, without restrictive endorsements, as filed by the Insurance Services Office and must include:

City shall be named as an Additional Insured on both the General Liability (GL) and Business Automobile Liability policies, on a primary and non-contributory basis, to include additional insured status on the GL policy for both premises operations and products and completed operations.

If no deductible for insurance is referenced above, the City reserves the right to require such deductibles which shall be determined by the Risk Management Division, but not more than $25,000 per claim.

The Comprehensive General Liability insurance policy must include coverage that is not more restrictive than the latest edition of the Comprehensive General Liability Policy, without restrictive endorsements, as filed by the Insurance Services Offices, and the policy must include coverage's for premises and/or operations, independent contractors, products and/or completed operations for contracts, contractual liability, broad form contractual coverage, broad form property damage, products, completed operations, and personal injury. Personal injury coverage shall include coverage that has the Employee and Contractual Exclusions removed.

2.13 PERFORMANCE BOND AND CONSTRUCTION BOND

The Bidder to whom a contingent award is made shall duly execute and deliver to the City a Performance Bond and a Construction Bond, both in an amount equal to 100% of the total contract price, payable to the City, as surety for faithful performance under the terms and conditions of the contract. The Performance Bond and Construction Bond shall be delivered to the City contemporaneously with contract execution. The bonds shall be substantially in the format of the examples that are a part of this Solicitation.

Both required Bonds must be executed by a surety company of recognized standing, authorized to do business in the State of Florida, and having a resident agent Bonds may not be canceled, terminated, or revised unless the City has been provided with thirty (30) days' advanced written notice of such action by the surety. The surety must insert the registered agent to accept service of process in the State of Florida, directly on each bond document.

Acknowledgement and agreement is given by both parties that the performance and construction bonds do not limit the liability of the awarded Bidder to the City in the event of a material breach of the contract agreement by the awarded Bidder. The bonds may be used to recover liquidated damages on behalf of the City.

If the awarded Bidder fails to deliver the bonds at the same time as contract execution, the City may declare the awarded Bidder in default of the contractual terms and conditions, and the awarded Bidder shall surrender any bid bond, and the City shall not accept any offers or bids from that Bidder for a twelve (12) month period following such default.

2.14 CERTIFICATIONS

Any Bidder that submits an offer in response to this Solicitation shall, at the time of such offer, hold all necessary certifications issued by the State or County Examining Board qualifying the Bidder to perform the work proposed for this project. If other professions or trades are required in conjunction with this Solicitation and such work/services will be performed or provided by a subcontractor(s), an applicable Certificate of Competency issued to the subcontractor(s) shall be submitted with the Bidder's offer; provided, however, that the City may at its option and in its best interest allow the Bidder to supply the subcontractor(s) certificate to the City during the evaluation period.

All architects or engineers on this project must possess current Florida professional registrations or licenses for the architectural and engineering services which they intend to provide.

2.15 BID BOND/GUARANTY
Intentionally Omitted.

2.16 METHOD OF PAYMENT: INVOICE FOR COMPLETED WORK
The awarded Bidder shall submit an invoice to the City for progress payments for work that has been completed, and has been inspected and accepted by the City. The date of the invoices shall not exceed thirty (30) calendar days from the completion of that portion of the work. Under no circumstances shall the invoice be submitted to the City in advance of the completion and acceptance of the work.

The invoice shall contain the following basic information: the awarded Bidder's name and address, invoice number, date of invoice, description of the goods or service, the contract number, purchase order number, and any discounts.

The City prides itself on paying its vendors promptly and efficiently, and as such requires that vendors accept payment via wire transfer, ACH (direct deposit), or an appropriate electronic payment method. The City is averse to issuing paper checks and seeks to discontinue this practice. All payments shall be made in accordance with the Florida Prompt Payment Act, Section 218.74, Florida Statutes, upon presentation of a proper invoice by the awarded Bidder.

2.17 COMPLETION OF WORK FROM DATE OF PURCHASE ORDER
The Bidder shall state in its offer the number of calendar days from the date of the Purchase Order in which it will guarantee to complete the Work. Time for completion may be considered a factor in determining the awarded Bidder if so stipulated in the Method of Award. The completion date <u>shall not exceed thirty (30) calendar days after date of the Purchase Order</u>.

2.18 WARRANTY REQUIREMENTS: ONE (1) YEAR
In addition to all other warranties that may be supplied by the Bidder, the awarded Bidder shall warrant its products and/or service against faulty labor and/or defective material, for a minimum period of one (1) year from the date of acceptance of the labor, materials and/or equipment by the City. This warranty requirement shall remain in force for the full period; regardless of whether the awarded Bidder is under contract with the City at the time of defect. Any payment by the City on behalf of the services received from the awarded Bidder does not constitute a waiver of these warranty provisions.

2.19 ADDITIONAL FACILITIES OR PRODUCTS
Although this Solicitation and resultant Contract may identify specific facilities or products, it is hereby agreed and understood that any City department or agency facility or related product may be added to this Contract at the option of the City, for similar products or services. The awarded Bidder shall be invited to submit price quotes for these additional facilities or products. If these quotes are determined to be fair and reasonable, then the additional work will be awarded to the awarded Bidder by formal modification of the Contract or Purchase Order. The City may determine to obtain price quotes for the additional facilities from non-contract awarded Bidder(s) in the event that fair and reasonable pricing is not obtained from the awarded Bidder, or for other reasons, at the City's discretion.

2.20 CATALOGS AND PRICE LISTS
Intentionally Omitted

2.21 CLEAN UP
The awarded Bidder shall remove all unusable materials and debris from the work areas at the end of each workday, and dispose of the same in an appropriate manner. Upon final completion, the awarded Bidder shall thoroughly clean up all areas where work has been involved.

2.22 DEMONSTRATION OF EQUIPMENT
Intentionally Omitted

2.23 HOURLY RATE
Any hourly rate quoted shall be deemed to provide full compensation to the awarded Bidder for labor, equipment use, travel time, and any other element of cost or price. This rate is assumed to be at straight-time for all labor, except as otherwise noted.

2.24 MOTOR VEHICLE LICENSE REQUIREMENT
Intentionally Omitted

2.25 PATENTS AND ROYALTIES
The awarded Bidder, without exception, shall indemnify and hold harmless the City and its employees from liability of any nature or kind, including cost and expenses for, or as a result of, any copyrighted, patented, or unpatented invention, process, or article manufactured by the awarded Bidder. The awarded Bidder has no liability when such claim is solely and exclusively due to the combination, operation, or use of any article supplied hereunder with equipment or data not supplied by awarded Bidder, or is based solely and exclusively upon the City's alteration of the article. The City will provide prompt written notification of a claim of copyright or patent infringement.

Further, if such a claim is made or is pending, the awarded Bidder may, at its option and expense, procure for the City the right to continue use of, replace or modify the article to render it noninfringing. (If none of the alternatives are reasonably available, the City agrees to return the article on request to the awarded Bidder and receive reimbursement, if any, as may be determined by a court of competent jurisdiction.) If the awarded Bidder uses any design, device, or materials covered by letters, patent or copyright, it is mutually agreed and understood without exception that the contract prices shall include all royalties or cost arising from the use of such design, device, or materials in any way involved in the work.

2.26 PRE-CONSTRUCTION CONFERENCE
The awarded Bidder is required to conduct a Pre-Construction Conference for City staff designated to represent the City prior to the construction or performance of the work specified in this Solicitation. The awarded Bidder may select the location of this construction conference, provided the conference is held in the southeast Florida area. Any costs incurred by City staff in conjunction with the pre-construction conference shall be borne by the City.

2.27 RELEASE OF CLAIM REQUIRED

Pursuant Section 255.05, *Florida Statutes* all payments to the subcontractors shall be made by the awarded Bidder within ten (10) days of receipt of the partial payment from the City. With the exception of the first partial payment, the awarded Bidder must pay all of its subcontractors and suppliers who have performed any work or supplied any materials for the project within ten (10) days after receipt of the partial payment by the awarded Bidder for monies due such subcontractors and suppliers as a result of a percentage of the work completed. The awarded Bidder must provide the City's project manager with duly executed affidavits (subcontractor's statement of satisfaction) or releases of claim from all subcontractors and suppliers who have performed any work or supplied any materials for on the project as of that date. The affidavit or releases shall certify that said subcontractors and suppliers have been paid their proportionate share of all previous partial payments to the awarded Bidder. In the event such affidavits cannot be furnished, the awarded Bidder may submit an executed consent of surety to requisition payment, identifying the subcontractors and suppliers with the amounts for which the statement of satisfaction cannot be furnished. If the awarded Bidder fails to provide a consent of surety to requisition payment, the amount in dispute will be withheld until either the statement of satisfaction is furnished, or the consent of surety to requisition payment is furnished.

2.28 SUBCONTRACTORS OF WORK SHALL BE IDENTIFIED

As part of its Bid, the Bidder must identify any and all subcontractors that will be used in the performance of the proposed work, their capabilities and experience, and the portion of the work to be done by the subcontractor. The competency of the subcontractor(s) with respect to experience, skill, responsibility and business standing shall be considered by the City when making the award in the best interest of the City. If the Bidder fails to identify any and all sub-contractors in the Bid, the Bidder may be allowed to submit this documentation during the Bid evaluation period, if such action is in the best interest of the City.

2.29 OTHER FORMS OR DOCUMENTS

If the City is required by the awarded Bidder to complete and execute any other forms or documents in relation to this Solicitation, the terms, conditions, and requirements in this Solicitation shall take precedence to any and all conflicting or modifying terms, conditions or requirements of the Bidder’s forms or documents.

2.30 FAILURE TO DELIVER OR COMPLETE WORK

Should the awarded Bidder fail to deliver or complete the work within the time stated in the Contract, it is hereby agreed and understood that the City reserves the authority to cancel the Contract with the awarded Bidder and secure the services of another vendor to purchase the items or complete the work. If the City exercises this authority, the City shall be responsible for paying the awarded Bidder for work which was completed and items delivered and accepted by the City in accordance with the Contract specifications. The City may, at its option, demand payment from the awarded Bidder, through an invoice or credit memo, for any additional costs over and beyond the original Contract price, which were incurred by the City, as a result of having to secure the services of another vendor.

2.31 CORRECTING DEFECTS

The awarded Bidder shall be responsible for promptly correcting any deficiency, at no cost to the City, within three (3) calendar days after the City notifies the awarded Bidder of such

deficiency in writing. If the awarded Bidder fails to correct the defect, the City may procure the products or services from another source and charge the awarded Bidder for any additional costs that are incurred by the City for this work or items; either through a credit memorandum or through invoicing.

2.32 ACCIDENT PREVENTION AND BARRICADES

Precautions shall be exercised at all times for the protection of persons and property. All contractors performing services or delivering goods under this contract shall conform to all relevant OSHA, State and City regulations during the course of such effort. Any fines levied by the above mentioned authorities for failure to comply with these requirements shall be borne solely by the awarded Bidder. Barricades shall be provided by the awarded Bidder when work is performed in areas traversed by persons, or when deemed necessary by the City.

2.33 OMISSIONS IN SPECIFICATIONS

The Statement of Work or description of items contained within this Solicitation describes the various work requirements deemed necessary for the completion of the project. Any omissions of inherent technical functions or classes of work within the Specifications and/or Statement of Work shall not relieve the awarded Bidder from furnishing, installing or performing such work where required to the satisfactory completion of the project.

2.34 MATERIALS SHALL BE NEW AND WARRANTED AGAINST DEFECTS

The awarded Bidder hereby acknowledges and agrees that all materials, except where recycled content is specifically requested, supplied by the awarded Bidder in conjunction with this Solicitation and resultant Contract shall be new, warranted for their merchantability, and fit for a particular purpose. In the event any of the materials supplied to the City by the awarded Bidder are found to be defective or do not conform to specifications: (1) the materials may be returned to the awarded Bidder at the awarded Bidder’s expense and the Contract cancelled or (2) the City may require the awarded Bidder to replace the materials at the awarded Bidder’s expense.

2.35 TOXIC SUBSTANCES/FEDERAL "RIGHT TO KNOW" REGULATIONS

The Federal "Right to Know" Regulation implemented by the Occupational Safety and Health Administration (OSHA) requires employers to inform their employees of any toxic substances to which they may be exposed in the workplace, and to provide training in safe handling practices and emergency procedures. It also requires notification to local fire departments of the location and characteristics of all toxic substances regularly present in the workplace.

Accordingly, the awarded Bidder performing under this Contract is required to provide two (2) complete sets of Material Safety Data Sheets to the City for any products that are subject to these regulations. This information shall be provided at the time when the initial delivery is made, on a product by product basis.

2.36 EQUIPMENT RENTAL RATES

The awarded Bidder hereby acknowledges and agrees to comply with 23 CFR 635.120 and 48 CFR 31.

2.37 FOREIGN CONTRACTORS

In accordance with 49 CFR 30, the awarded Bidder acknowledges and agrees to not utilize suppliers of goods and services of countries that deny procurement market access to U.S. contractors.

END OF SECTION 2

SECTION 3
SCOPE OF WORK AND SPECIFICATIONS

3.1 GENERAL REQUIREMENTS

The work required under this Solicitation includes the construction of roads, sidewalks, bicycle lanes and crosswalk improvements. The estimated budget for the construction of this project is $1,100,000.00.

The Northeast 2nd Avenue / Seacrest Beautification projects initiated in response to the requests from the Del Ida Park Neighborhood Community for a more aesthetically pleasing streetscape that addressed pedestrian and bicyclist safety along a main corridor leading directly into downtown Delray Beach. The City of Delray Beach and Delray Beach CRA have acknowledged the need for beautification and other necessary improvements through the development of the Seacrest/Del-Ida Park Neighborhood Plan which was adopted by the City Commission on March 3, 1998. The City's Bicycle/Pedestrian Plan as well as the Metropolitan Planning Organization (MPO) Master Comprehensive Bicycle Transportation Plan also recommends the provision for bicycle facilities along the NE 2nd Avenue (Seacrest) corridor. As a result, the Seacrest Beautification projects will provide for and/or increase the use of pedestrian and bicycle facilities, while creating an appropriately improved streetscape within a highly visible neighborhood.

The Northeast 2nd Avenue / Seacrest Beautification projects are federally funded through the Florida Department of Transportation (FDOT) Local Agency Program. The project evolved into four phases. Phase 0 limits are from Lake Ida to NE 8th Street / George Bush Boulevard and construction was completed December 2016. Phase 1 limits are from NE 8th Street/George Bush Boulevard (southern terminus) to NE 13th Street (northern terminus). Phase 2 and 3 extends from NE 13th Street to NE 22nd Street. The scope of this project will only include improvements that span the limits of Phase 1. This project includes the following components:

a. Reduction in Travel Lane Width: The present width of each travel lane is twelve feet (12'); the City seeks to reduce each lane to ten feet (10'). The reduction will not only assist in the provision of bicycle facilities, but will encourage motorists to maintain the posted speed limit as they travel through a residential area and into a thriving downtown.

b. Sidewalks (5' wide concrete): Sidewalks will be removed and replaced, as needed. Where no sidewalks currently exist, sidewalks will be constructed.

c. Dedicated Bike Lanes: A four foot (4') wide dedicated bike lane will be provided on each side of NE 2nd Avenue and contain appropriate markings, complemented by sufficient signage to create awareness for both motorists and pedestrians. The bike lane will be constructed with a green pavement surface coating to designate the bike lane per the FDOT LAP Agreement.

d. Crosswalks: Brick paver crosswalks will be provided at all north/south intersections within the project area, while an east/west crosswalk will be provided at George Bush Blvd only.

e. Local Agency Program (LAP) Administration: Assist the City in the preparation of documents, reporting and coordination to meet the obligations and responsibilities of the LAP Agreement.

f. LAP Environmental Review: Prepare a report based on the Class of Action for this project being a Programmatic Categorical Exclusion (PCE) per the Federal Highway Administration (FHWA, Federal Transit Authority (FTA), and the Florida Department of Transportation (FDOT Agency Operating Agreement.

The awarded Bidder shall be responsible for performing all required site preparation tests, surveys, and studies to prepare the site for the construction of the building shell.

3.2 DRAWINGS
Drawings for this project are herein incorporated into this solicitation as Exhibit A, Drawings.

3.3 TECHNICAL SPECIFICATIONS
Technical specifications for this project are herein incorporated into this solicitation as Exhibit B, Technical Specifications.

3.4 FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) REQUIREMENTS
FDOT requirements for this project are herein incorporated into this solicitation as Exhibit C, FDOT Requirements.

3.5 PROJECT TIMELINE
The awarded Bidder shall agree to complete the work <u>no later than 180 days after the Notice to Proceed is issued</u>. The City, at its discretion may allow for time extensions for unforeseen and unexpected delays.

3.6 BASE BID ITEM NOS. 1 THROUGH 29
Includes bid items for general conditions, demolition, and roadway construction. Refer to Exhibit B, Technical Specifications, for a complete listing of bid items.

3.7 ALTERNATE, BID ITEM NO. 30
Option to add decorative paver brick crosswalks. Refer to Exhibit B, Technical Specifications, for a complete listing of bid items.

3.8 ALTERNATE, BID ITEM NO. 31
Option to remove and replace sidewalk. Refer to Exhibit B, Technical Specifications, for a complete listing of bid items.

3.9 ALTERNATE, BID ITEM NO. 32
Option to add asphalt rubber membrane interlayer (ARMI). Refer to Exhibit B, Technical Specifications, for a complete listing of bid items.

END OF SECTION 3

BID SUBMITTAL

This Page and all following pages comprise your original Bid Submittal package. Bidders must attach any additional information or documentation requested in this Invitation to Bid Construction. There is no need to include the preceding Sections 1, 2, and 3 in your Bid Submittal package.

INSTRUCTIONS

Sealed Bids must be received on or before the due date and time (local time) via electronic submission at www.bidsync.com or at the City of Delray Beach City Hall Front Lobby Reception Desk, 100 N.W. 1st Avenue, Delray Beach, Florida 33444. Normal City business hours are 8:00 AM to 5:00 PM, Monday through Friday, except holidays. **All Bids will be publicly opened** at City Hall unless otherwise specified.

Each hard copy Bid submitted to the City shall have the following information clearly marked on the face of the envelope: Bidder's name, return address, ITBC number, due date for Bids, and the title of the Bid. Included in the package shall be one (1) hard copy original clearly identified as the "Original" that includes a signed original of the Solicitation Summary, one (1) duplicate hard copy, and one (1) electronic version of the Bid on a compact disc (CD) or a Universal Serial Bus (USB) drive in a usable PDF format. If the Solicitation Summary is not included in the package as a hard copy, the City may deem the Bid non-responsive. Bids must contain all information required to be included in the submittal, as described in this Solicitation.

Invitation to Bid Construction No.: 2017-065-2

Title: PHASE 1 OF SEACREST BEAUTIFICATION

Due Date and Time: September 8, 2017 @ 2:00 PM local time

_____

Name of Bidder (type or print)

SECTION 4
PRICING SCHEDULE

4.1 PRICES AND RATES

The Bidder shall indicate on the Microsoft Excel® formatted document titled Exhibit D, Bid Prices, the firm and fixed prices and rates offered to the City for the work described in this Solicitation, including the Alternates.

END OF SECTION 4

SECTION 5
MINIMUM QUALIFICATIONS

5.1 Each bidder shall submit information and documentation requested that confirms it meets the following qualification requirement(s). For the purposes of this ITBC, a responsible Bidder is a Bidder that meets the minimum qualification requirements.

a. Bidder is registered with the States of Florida, Division of Corporations to do business in Florida.

No documentation is required. The City will verify.

b. Bidder must have been in the business for a minimum of twenty-four (24) months prior to the Due Date and Time.

Provide supporting documentation (e.g. state, county, city business license or occupational license) that confirms Bidder has been in business for a minimum of twenty-four months.

c. Bidder must have completed, as the Prime Contractor, a minimum of two construction projects involving the following types of work: roads, sidewalks, bicycle lanes and/or crosswalk improvements.

Provide the following information for the two qualifying clients, whom of which are willing and able to confirm the qualifying contracts.

- **i. Entity Name**
- **ii. Entity's Primary Contact for contract**
  - **a) Name**
  - **b) Title**
  - **c) Phone Number**
  - **d) Email Address**
- **iii. Contract Term (Start/End Date)**
- **iv. Type of work (roads, sidewalks, bicycle lanes, crosswalk improvements)**

d. Bidder must have a Florida General Contractor license, issued by the State of Florida, Department of Business and Professional Regulation Construction Industry Licensing Board.

Submit a copy of Bidder's current General Contractor's license issued by the State of Florida Department of Business and Professional Regulation.

e. Bidder has no reported conflict of interests in relation to this ITBC

Disclose the name of any officer, director or agent who is also an employee of the City. Disclose the name of any City employee who owns, directly or indirectly, any interest in the Bidder's firm or any of its branches. If no conflicts of interests are present, Bidder must submit a statement to that affect.

END OF SECTION 5

SECTION 6
ACKNOWLEDGEMENT OF ADDENDA

INSTRUCTIONS: COMPLETE PART I OR PART II, WHICHEVER APPLIES

PART I:

List below the dates of issue for each addendum received in connection with this Solicitation:

Addendum #1, Dated _____

Addendum #2, Dated _____

Addendum #3, Dated _____

Addendum #4, Dated _____

Addendum #5, Dated _____

Addendum #6, Dated _____

Addendum #7, Dated _____

Addendum #8, Dated _____

PART II:

☐ NO ADDENDUM WAS RECEIVED IN CONNECTION WITH THIS SOLICITATION

_____
Firm Name

_____
Signature

_____
Name and Title (Print or Type)

_____
Date

SECTION 7
BID SUBMITTAL SIGNATURE PAGE

By signing this Bid the Bidder certifies that it satisfies all legal requirements as an entity to do business with the City, including all Conflict of Interest and Code of Ethics provisions.

Firm Name:

_____

Street Address:

_____

Mailing Address (if different than Street Address):

_____

Telephone Number(s): _____

Fax Number(s): _____

Email Address: _____

Federal Employer Identification Number: _____

Prompt Payment Terms: _____% _____ days' net _____days

Signature: _____
(Signature of authorized agent)

Print Name: _____

Title: _____

By signing this document, the Bidder agrees to all Terms and Conditions of this Solicitation and the resulting Contract/Agreement.

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF BIDDER TO BE BOUND BY THE TERMS OF ITS OFFER, FOR NOT LESS THAN 90 DAYS, AND THE BIDDER'S UNEQUIVOCAL OFFER TO BE BOUND BY THE TERMS AND CONDITIONS SET FORTH IN THIS INVITATION TO BID CONSTRUCTION. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED ABOVE, BY AN AUTHORIZED REPRESENTATIVE, SHALL RENDER THE BID NON-RESPONSIVE. THE CITY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY BID THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE BIDDER TO THE TERMS OF ITS OFFER.

SECTION 8
AFFIDAVITS, PERFORMANCE AND PAYMENT BONDS FORMAT, LETTER OF CREDIT FORMAT

8.1 AFFIDAVITS

The forms listed below must be completed by an official having legal authorization to contractually bind the company or firm. Each signature represents a binding commitment upon the Bidder to provide the goods and/or services offered to the City if the Bidder is determined to be the lowest responsive and responsible Bidder.

a. Bid Submittal Signature Page

b. Acknowledgement of Addenda

c. Conflict of Interest Disclosure Form

d. Notification of Public Entity Crimes Law

e. Notification of Public Records Law

f. Drug-Free Work Place

g. Non-Collusion Affidavit

h. Sample Performance Bond Format (if required, will be requested from bidder recommended for award) DO NOT COMPLETE

i. Sample Payment Bond Format (if required, will be requested from bidder recommended for award) DO NOT COMPLETE

j. Sample Letter of Credit Format (if required, will be requested from bidder recommended for award) DO NOT COMPLETE

k. FDOT Required Forms (Exhibit C)

l. Solicitation Summary

CONFLICT OF INTEREST DISCLOSURE FORM

The award of this contract is subject to the provisions of Chapter 112, *Florida Statutes*. All Bidders must disclose within their Bids: the name of any officer, director, or agent who is also an employee of the City of Delray Beach.

Furthermore, all Bidders must disclose the name of any City employee who owns, directly, or indirectly, an interest of more than five percent (5%) in the Bidder's firm or any of its branches.

The purpose of this disclosure form is to give the City the information needed to identify potential conflicts of interest for evaluation team members and other key personnel involved in the award of this contract.

The term "conflict of interest" refers to situations in which financial or other personal considerations may adversely affect, or have the appearance of adversely affecting, an employee's professional judgment in exercising any City duty or responsibility in administration, management, instruction, research, or other professional activities.

Please check one of the following statements and attach additional documentation if necessary:

_____ To the best of our knowledge, the undersigned firm has no potential conflict of interest due to any other Cities, Counties, contracts, or property interest for this Bid.

_____ The undersigned firm, by attachment to this form, submits information which may be a potential conflict of interest due to other Cities, Counties, contracts, or property interest for this Bid.

Acknowledged by:

_____
Firm Name

_____
Signature

_____
Name and Title (Print or Type)

_____
Date

NOTIFICATION OF PUBLIC ENTITY CRIMES LAW

Pursuant to Section 287.133, *Florida Statutes*, you are hereby notified that a person or affiliate who has been placed on the convicted contractors list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases or real property to a public entity, may not be awarded or perform work as a contractor, supplier, sub-vendor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 [F.S.] for Category Two [$35,000.00] for a period of thirty-six (36) months from the date of being placed on the convicted contractors list.

Acknowledged by:

_____
Firm Name

_____
Signature

_____
Name and Title (Print or Type)

_____
Date

Notification of Public Records Law Pertaining to Public Contracts and Requests for Contractor Records Pursuant to Chapter 119, *Florida Statutes*

Pursuant to Chapter 119, *Florida Statutes*, Contractor shall comply with the public records law by keeping and maintaining public records required by the City of Delray Beach in order to perform the service. Upon request from the City of Delray Beach' custodian of public records, contract shall provide the City of Delray Beach with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, *Florida Statutes* or as otherwise provided by law. Contractor shall ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract If the Contractor does not transfer the records to the City of Delray Beach. Contractor upon completion of the contract, shall transfer, at no cost, to the City of Delray Beach all public records in possession of the Contractor or keep and maintain public records required by the City of Delray Beach in order to perform the service. If the Contractor transfers all public records to the City of Delray Beach upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City of Delray Beach, upon request from the City of Delray Beach' custodian of public records, in a format that is compatible with the information technology systems of the City of Delray Beach.

IF THE SUCCESSFUL BIDDER HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE SUCCESSFUL BIDDER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT CITY OF DELRAY BEACH, CITY CLERK, 100 N.W. 1ST AVE., DELRAY BEACH FLORIDA. THE CITY CLERK'S OFFICE MAY BE CONTACTED BY PHONE AT 561-243-7050 OR VIA EMAIL AT CITYCLERK@MYDELRAYBEACH.COM.

Acknowledged by:

_____
Firm Name

_____
Signature

_____
Name and Title (Print or Type)

_____
Date

DRUG-FREE WORKPLACE

_____is a drug-free workplace and has
(Company Name)
a substance abuse policy in accordance with and pursuant to Section 440.102, *Florida Statutes*.

Acknowledged by:

_____
Firm Name

_____
Signature

_____
Name and Title (Print or Type)

_____
Date

NON-COLLUSION AFFIDAVIT

STATE OF _____
COUNTY OF _____

Before me, the undersigned authority, personally appeared _____, who, after being by me first duly sworn, deposes and says of his/her personal knowledge that:

a. He/She is _____ of _____, the Bidder that has submitted a Bid to perform work for the following:

ITBC No.: _____ Title: _____

b. He/She is fully informed respecting the preparation and contents of the attached Request for Bids, and of all pertinent circumstances respecting such Solicitation.

Such Bid is genuine and is not a collusive or sham Bid.

c. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with the Solicitation and contract for which the attached Bid has been submitted or to refrain from proposing in connection with such Solicitation and contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or any other Bidder, or to fix any overhead, profit, or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the City or any person interested in the proposed contract.

d. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

_____
Signature

Subscribed and sworn to (or affirmed) before me this _____ day of _____ 20__, by _____, who is personally known to me or who has produced _____ as identification.

SEAL

Notary Signature_____
Notary Name: _____
Notary Public (State): _____
My Commission No: _____
Expires on: _____

SAMPLE PERFORMANCE BOND FORMAT

KNOW ALL MEN BY THESE PRESENTS: that -_____

_____,

(Insert full name and address or legal title of successful Bidder)

as Principal, hereinafter called Contractor, and _____,
(Name of Insurer)
as Surety, hereinafter called Surety, are held and firmly bound unto the City of Delray Beach, Palm Beach County, Florida.

As Obligee, hereinafter called the City, in the amount of _____, ($_____), for the payment whereof, Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severably, firmly by the presents.

WHEREAS, Contractor has by written agreement dated _____, 20__, entered into Contract No._____ with the City in accordance with the Solicitation specifications prepared by the City, which Contract is by reference made a part hereof and is hereinafter referred as the Contract, for the performance of the following Work:

_____

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the City.

Whenever Contractor shall be and declared by the City to be in default under the Contract, the City having performed City's obligations thereunder, the Surety may promptly remedy the default or shall promptly:

a. Complete the Contract in accordance with its terms and conditions; or

b. Obtain a Bid or Bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the most responsible Bidder, or if the City elects, upon determination by the City and the Surety jointly of the most responsible Bidder, arrange for a Contract between such Bidder and the City, and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof.

The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the City to Contractor under the contract and any amendments thereto, less the amount properly paid by the City to the Contractor.

Any suit under this bond must be instituted before the expiration of twenty-five (25) months from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the City named herein or the heirs, executors, administrators, or successors of the City.

Signed and sealed this _____ day of _____, 20__.

_____
(Principal) (Seal)

_____ _____
(Witness) (Title)

_____
(Name of Insurer) Surety (Seal)

_____ By: _____
(Witness) (Attorney-in-Fact)

SAMPLE PAYMENT BOND FORMAT

KNOW ALL MEN BY THESE PRESENTS: that -_____

_____,

(Insert full name and address or legal title of successful Bidder)

as Principal, hereinafter called Contractor, and _____,
(Name of Insurer)
as Surety, hereinafter called Surety, are held and firmly bound unto the City of Delray Beach, Palm Beach County, Florida.

As Obligee, hereinafter called the City, in the amount of _____, ($_____), for the payment whereof, Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severably, firmly by the presents.

WHEREAS, Contractor has by written agreement dated _____, 20__, entered into Contract No._____ with the City in accordance with the Solicitation specifications prepared by the City, which Contract is by reference made a part hereof and is hereinafter referred as the Contract, for the performance of the following Work:

_____

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if said Contractor and all subcontractors to whom any portion of the work provided for in said Contract is sublet and all assignees of said Contract and of such subcontractors shall promptly make payments to all persons supplying him or them with labor, products, services, or supplies for or in the prosecution of the work provided for in such Contract, or in any amendment or extension of or addition to said Contract, and for the payment of reasonable attorney's fees, incurred by the claimants in suits on this bond, then the above obligation shall be void; otherwise, it shall remain in full force and effect.

HOWEVER, this bond is subject to the following conditions and limitations:

a) Any person, firm or corporation that has furnished labor, products, or supplies for or in the prosecution of the work provided for in said Contract shall have a direct right of action against the Contractor and Surety on this bond, which right of action shall be asserted in a proceeding, instituted in the county in which the work provided for in said Contract is to be performed or in any county in which Contractor or Surety does business. Such right of action shall be asserted in proceedings instituted in the name of the claimant or claimants for his or their use and benefit against said Contractor and Surety or either of them (but not later than one year after the final settlement of said Contract) in which action such claim or claims shall be adjudicated and judgment rendered thereon.

b) The Principal and Surety hereby designate and appoint _____

_____as the agent of each of them to receive and accept service of process or other pleading issued or filed in any proceeding instituted on

this bond and hereby consent that such service shall be the same as personal service on the Contractor and/or Surety.

c) In no event shall the Surety be liable for a greater sum than the penalty of this bond, or subject to any suit, action or proceeding thereon that is instituted later than one year after the final settlement of said Contract.

d) This bond is given pursuant to and in accordance with the provisions of Florida Statutes, and all the provisions of the law referring to this character of bond as set forth in any sections or as may be hereinafter enacted, and these are hereby made a part hereof to the same extent as if set out herein in full.

Any suit under this bond must be instituted before the expiration of twenty-five (25) months from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the City named herein or the heirs, executors, administrators, or successors of the City.

Signed and sealed this _____ day of _____, 20__.

_____
(Principal) (Seal)

_____ _____
(Witness) (Title)

_____
(Name of Insurer) Surety (Seal)

_____ By: _____
(Witness) (Attorney-in-Fact)

SAMPLE LETTER OF CREDIT FORMAT

LETTER OF CREDIT NO.: _____
ISSUANCE DATE: _____

APPLICANT:
{Name of Corporation} _____
{Address}_____
{City, State, Zip} _____

BENEFICIARY:
CITY OF DELRAY BEACH
100 N.W. 1ST AVENUE
DELRAY BEACH, FLORIDA 33444

FOR U.S.D. $_____
DATE OF EXPIRATION: _____

WE HEREBY ESTABLISH OUR IRREVOCABLE LETTER OF CREDIT NO. _____ IN FAVOR OF THE BENEFICIARY, THE CITY OF DELRAY BEACH, FLORIDA (HEREINAFTER "CDB") FOR THE ACCOUNT OF THE ABOVE-REFERENCED APPLICANT, AVAILABLE BY YOUR DRAFTS DRAWN ON (Insert name of Bank) PAYABLE AT SIGHT FOR ANY SUM OF MONEY NOT TO EXCEED A TOTAL OF (Insert the amount of money), THE AMOUNT REFERENCED ABOVE.

DEMANDS OF THE LETTER OF CREDIT MUST BE ACCOMPANIED BY A STATEMENT FROM THE CITY MANAGER OF THE CITY OF DELRAY BEACH CERTIFYING EITHER: (1) THAT SAID LETTER OF CREDIT IS ABOUT TO EXPIRE AND HAS NOT BEEN RENEWED, OR (2) THAT WORK HAS NOT BEEN COMPLETED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND AGREEMENTS (INCLUDING ANY AMENDMENTS THEREOF) FOR THE FOLLOWING PROJECT: **{Name of Project}** _____ (THE 'PROJECT').

IT IS A CONDITION OF THIS LETTER OF CREDIT THAT IT WILL BE AUTOMATICALLY EXTENDED FOR PERIODS OF ONE YEAR FROM EXPIRY DATE HEREOF, OR ANY FUTURE EXPIRATION DATE, WITHOUT ANY AMENDMENT, UNLESS THIRTY (30) DAYS BUT NO MORE THAN SIXTY (60) DAYS PRIOR TO ANY EXPIRATION DATE WE SHALL NOTIFY CDB IN WRITING BY CERTIFIED MAIL RETURN RECEIPT REQUESTED, OR BY COURIER VIA HAND DELIVERY AT THE ABOVE-LISTED ADDRESS, THAT WE ELECT NOT TO CONSIDER THIS LETTER OF CREDIT RENEWED FOR ANY SUCH ADDITIONAL PERIOD.

WE HEREBY AGREE WITH THE DRAWERS, ENDORSERS, AND BONA FIDE HOLDERS OF ALL DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THE CREDIT THAT SUCH DRAFTS WILL BE DULY HONORED UPON PRESENTATION TO **{Name of Bank}** _____ (THE 'BANK'), WHICH IS DULY AUTHORIZED TO CONDUCT BUSINESS IN THE STATE OF FLORIDA IN ACCORDANCE WITH THE TERMS HEREOF. IF A DRAFT, AS DESCRIBED IN THIS LETTER OF CREDIT, IS PRESENTED PRIOR TO THE EXPIRATION DATE AND IN CONFORMITY WITH THE TERMS OF THIS LETTER OF

CREDIT AND UPON PRESENTATION IT IS WRONGFULLY DISHONORED BY THE BANK, THE BANK AGREES TO PAY REASONABLE ATTORNEYS FEES AND COSTS, INCLUDING FEES AND COSTS ON APPEAL, INCURRED BY THE CITY OF DELRAY BEACH TO ENFORCE THIS LETTER OF CREDIT SHOULD CDB PREVAIL.

DOCUMENTS MUST BE PRESENTED FOR PAYMENT TO:
{Name of Bank Branch} _____
{Address}_____
{City, State, Zip} _____
ATTN: **{Department}** _____

ALL DRAWINGS UNDER THIS LETTER OF CREDIT MUST BE ACCOMPANIED BY THE ORIGINAL LETTER OF CREDIT INSTRUMENT WHICH WILL BE RETURNED TO THE BENEFICIARY AFTER ENDORSING THE BACK OF SAME WITH THE AMOUNT OF EACH DRAWING BY US.

PARTIAL DRAWINGS ARE PERMITTED.

THE AMOUNT OF ANY DRAFT DRAWN UNDER THIS CREDIT MUST BE ENDORSED ON THE REVERSE OF THE ORIGINAL CREDIT. ALL DRAFTS MUST BE MARKED "DRAWN UNDER **{Name of Bank}** _____ LETTER OF CREDIT NUMBER _____ DATED _____, 20__."

THIS CREDIT IS SUBJECT TO THE "UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS, (2007 REVISION), INTERNATIONAL CHAMBER OF COMMERCE PUBLICATION NO. 600", AND TO THE PROVISIONS OF FLORIDA LAW. IF A CONFLICT BETWEEN THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS AND FLORIDA LAW SHOULD ARISE, FLORIDA LAW SHALL PREVAIL. IF A CONFLICT BETWEEN THE LAW OF ANOTHER STATE OR COUNTRY AND FLORIDA LAW SHOULD ARISE, FLORIDA LAW SHALL PREVAIL. VENUE FOR ANY DISPUTES RELATING TO THE ENFORCEMENT OF THIS LETTER OF CREDIT SHALL BE PALM BEACH COUNTY, FLORIDA.

{Name of Bank} _____

BY: _____
{Name}_____
{Title}_____

SECTION 9
SAMPLE AGREEMENT FORMAT

Below is the standard agreement format for this Invitation to Bid Construction. This is a sample agreement only and is subject to revisions. **DO NOT COMPLETE.**

AGREEMENT

THIS AGREEMENT is hereby made and entered into this ____ day of _____, 20__, (the "effective date") by and between the City of Delray Beach, a Florida municipal corporation ("City"), whose address is 100 N.W. 1st Avenue, Delray Beach, Florida 33444, and _____, a Florida corporation authorized to do business in Florida (hereafter referred to as "Contractor"), whose address is _____.

WHEREAS, the City desires to retain the services of the Contractor to provide the goods and services in accordance with the City's Invitation to Bid Construction No. 2017-065-2, and the Contractor's response thereto, all of which are incorporated herein by reference.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereafter set forth, the Contractor and the City agree as follows:

ARTICLE 1. INCORPORATION OF INVITATION TO BID CONSTRUCTION

The terms and conditions of this Agreement shall include and incorporate the terms, conditions, and specifications set forth in the City's Invitation to Bid Construction No. 2017-065-2, and the Contractor's response to the Invitation to Bid Construction, including all documentation required thereunder.

ARTICLE 2. DESCRIPTION OF GOODS OR SCOPE OF SERVICES

The Contractor shall provide the goods and/or perform those services identified in the specifications accompanying the City's Invitation to Bid Construction, which are incorporated herein by reference.

ARTICLE 3. COMPENSATION

The City shall pay to the Contractor, in compliance with the Pricing Schedule attached hereto and incorporated herein, according to the terms and specifications of the referenced Invitation to Bid Construction.

ARTICLE 4. MISCELLANEOUS PROVISIONS

a. Notice Format. All notices or other written communications required, contemplated, or permitted under this Agreement shall be in writing and shall be hand delivered, telecommunicated, or mailed by registered or certified mail (postage prepaid), return receipt requested, to the following addresses:

i. As to the City: City of Delray Beach
100 N.W. 1st Avenue
Delray Beach, Florida 33444
Attn: City Manager
Email:

ii. with a copy to: City of Delray Beach
100 N.W. 1st Avenue
Delray Beach, Florida 33444
Attn: City Attorney
Email:

iii. As to the Contractor: _____
_____
_____
Attn.:_____
Email:_____

b. Headings. The headings contained in this Agreement are for convenience of reference only, and shall not limit or otherwise affect in any way the meaning or interpretation of this Agreement.

c. Effective Date. The effective date of this Agreement shall be as of the date it has been executed by both the parties hereto.

ARTICLE 5. CONTRACT TERM

This term of this Agreement shall be from the effective date through the end of construction, unless terminated earlier in accordance with terms set forth in the ITBC.

(Remainder of this page is intentionally left blank.)

IN WITNESS WHEREOF, the parties have executed this Agreement on the dates hereinafter written.

CITY OF DELRAY BEACH, FLORIDA

[SEAL]

By: _____
Cary D. Glickstein, City Mayor

ATTEST:

By: _____
Katerri Johnson, City Clerk

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY

By: _____
R. Max Lohman, City Attorney

CONTRACTOR

_____,

By: _____

Print Name: _____

Title: _____

WITNESS:

By: _____

Print Name: _____

SECTION 10
EXHIBITS

10.1 EXHIBIT A, DRAWINGS

10.2 EXHIBIT B, TECHNICAL SPECIFICATIONS

10.3 EXHIBIT C, FDOT REQUIREMENTS

10.4 EXHIBIT D, BID PRICES

END OF SECTION 10

SECTION 11
SOLICITATION SUMMARY

The City of Delray Beach
100 N.W. 1st Avenue
Delray Beach, FL 33444

PURCHASING DEPARTMENT

SOLICITATION SUMMARY

IMPORTANT NOTICE
The information you provide on this page will be read aloud at the PUBLIC OPENING for this Solicitation. It is VERY IMPORTANT that the summary information you provide below is exactly the same information contained in your Bid. If subsequent to the opening of Bids, the City determines that the information contained in the electronic version of your Bid is different from the information on this Solicitation Summary, the City reserves the right to deem your Bid NON-RESPONSIVE, and remove your Bid from further evaluation and consideration for contract award.

BID INFORMATION

Bid Number: ITBC No. 2017-065-2

Title: PHASE 1 OF SEACREST BEAUTIFICATION

Due Date and Time: SEPTEMBER 8, 2017 @ 2:00PM EST

Name of Bidder: _____

Address: _____

Contact Person: _____

Bid Amount: $_____

Authorized Signature: _____

Date: _____

By signing and submitting this Solicitation Summary, the Bidder affirms that the information provided above is an exact and correct summary of the information contained in the electronic version of the Bidder's Bid to the City of Delray Beach.

THIS SOLICITATION SUMMARY MUST BE SIGNED AND INCLUDED AS AN ORIGINAL HARDCOPY IN THE SEALED PACKAGE CONTAINING YOUR BID OR SIGNED AND INCLUDED WITH YOUR SECURE ELECTRONIC BID SUBMITTAL THROUGH WWW.BIDSYNC.COM.

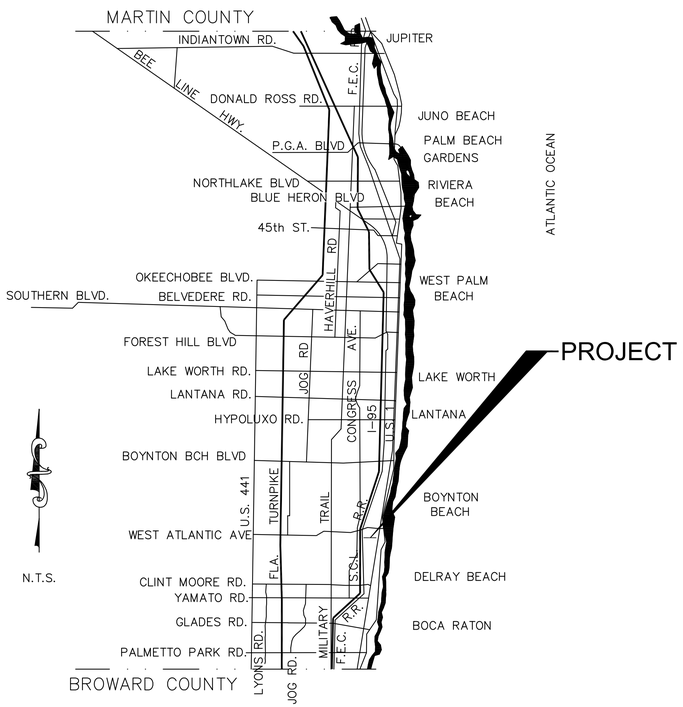
CITY OF DELRAY BEACH

NE 2ND AVENUE / SEACREST

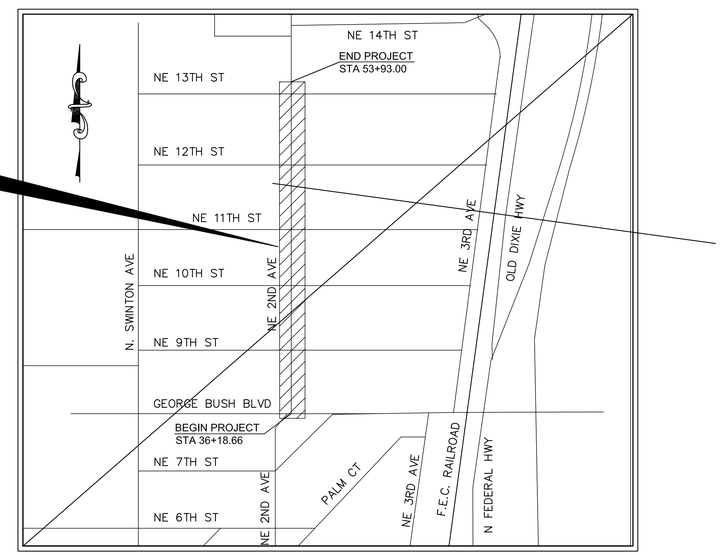
PHASE 1

CITY PROJECT NO. 14-071

FM No. 435080-1-58-01



PROJECT



LOCATION MAP

NO SCALE

SECTION 9, TOWNSHIP 46 SOUTH, RANGE 43 EAST

PROJECT LENGTH

1,771.34 FEET
0.34 MILES

VERTICAL DATUM: NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983, FLORIDA STATE PLANES, EAST ZONE, U.S. FEET (NAD83)

PLANS ARE SCALED TO PLOT ON 24" X 36" SHEETS. THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

CITY OFFICIALS

MAYOR	CARY D. GLICKSTEIN
VICE MAYOR	SHELLY PETROLIA
DEPUTY VICE MAYOR	AL JACQUET
COMMISSIONER	JORDANA L. JARJURA
COMMISSIONER	MITCHELL KATZ
CITY MANAGER	DONALD B. COOPER
DIRECTOR OF ENVIRONMENTAL SERVICES DEPARTMENT	JOHN MORGAN
CITY ENGINEER	ISAAC KOVNER, P.E.

INDEX OF SHEETS

CITY of DELRAY BEACH
ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE, DELRAY BEACH, FLORIDA 33444
Phone: (561) 243-7322 Fax: (561) 243-7314

PREPARED BY:
WGI™
2035 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

811 Know what's below. Call before you dig.

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795
5/4/17

CITY OF DELRAY BEACH
NE 2ND AVENUE / SEACREST
PHASE1
PRODUCTION SUBMITTAL
WGI NO.: 1004.11

DEFINITIONS

1. CITY – THE CITY OF DELRAY BEACH
2. CONTRACTOR – PRIME CONTRACTOR AND ALL SUBCONTRACTORS
3. ENGINEER – ENGINEER RESPONSIBLE FOR INSPECTION AND CERTIFICATION

PROCEDURE

1. A PRE–CONSTRUCTION MEETING IS TO BE HELD PRIOR TO DELIVERY OF MATERIALS AND INITIATION OF ANY WATER, SEWER OR DRAINAGE CONSTRUCTION. THE MEETING SHALL BE ATTENDED BY THE CITY, CONTRACTOR, SUBCONTRACTORS, ENGINEER AND OTHER INTERESTED PARTIES.
2. ANY REVISIONS TO THE APPROVED PLANS MUST BE APPROVED BY THE CITY PRIOR TO THE PRE–CONSTRUCTION MEETING.
3. A MINIMUM OF THREE (3) COPIES OF THE CURRENT APPROVED PRODUCT LIST AND ALL NECESSARY SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO SCHEDULING THE PRE–CONSTRUCTION MEETING. ALL PRODUCTS SHALL BE ON THE FDOT APPROVED PRODUCT LIST
4. ALL APPLICABLE PERMITS MUST BE OBTAINED WITH COPIES PROVIDED TO THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. THE CONTRACTOR SHALL MAINTAIN A CURRENT APPROVED SET OF CONSTRUCTION DOCUMENTS ON SITE AT ALL TIMES.
6. ALL MATERIALS SUPPLIED SHALL CONFORM TO PRODUCT LIST AND SHOP DRAWINGS AS APPROVED BY THE CITY PRIOR TO CONSTRUCTION. ALL REQUESTS FOR MATERIAL SUBSTITUTION SHALL BE APPROVED PRIOR TO DELIVERY OF THESE MATERIALS TO THE JOB SITE.
7. THE LOCATION OF THE EXISTING UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY IF OTHER UTILITIES (NOT SHOWN ON THE PLAN) EXIST WITHIN THE AREA OF CONSTRUCTION. SHOULD THERE BE UTILITY CONFLICTS, THE CONTRACTOR SHALL INFORM THE CITY AND NOTIFY THE RESPECTIVE UTILITY OWNER TO RESOLVE THE UTILITY CONFLICTS AND PERFORM THE UTILITY ADJUSTMENTS AS REQUIRED.
8. PRIOR TO ANY SANITARY PIPE OR WATER MAIN TESTING, UNDER EXISTING OR FUTURE PAVEMENT, THE ROCK BASE SHALL BE FINISHED AND PRIMED OR FIRST LIFT OF PAVEMENT PLACED.
9. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES THROUGHOUT THE DURATION OF CONSTRUCTION FOR THE PROTECTION OF EXISTING AND NEWLY INSTALLED UTILITIES FROM DAMAGE OR DISRUPTION OF SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING SUCH MEASURES AS NECESSARY TO PROTECT THE HEALTH, SAFETY, AND WELFARE OF THOSE PERSONS HAVING ACCESS TO THE WORK SITE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCATIONS OF ALL OTHER UTILITY FACILITIES.
11. THE CONTRACTOR SHALL SCHEDULE INSPECTIONS AND TESTS WITH THE CITY A MINIMUM OF 24 HOURS IN ADVANCE.
12. CONTRACTOR SHALL NOT DISTURB EXISTING CITY MAINS OR STRUCTURES WITHOUT THE PRESENCE OF A CITY INSPECTOR. CITY UTILITY SYSTEM VALVES AND APPURTENANCES MAY ONLY BE OPERATED BY CITY PERSONNEL.
13. FACILITIES PROPOSED HEREIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS. DEVIATIONS FROM THE APPROVED PLANS MUST BE APPROVED IN ADVANCE BY THE CITY.
14. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCE OF THE WORK, A FINAL INSPECTION SHALL VERIFY PROPER ADHERENCE TO ALL FACETS OF THE PLANS AND SPECIFICATIONS.
15. AS–BUILT DRAWINGS SHALL BE PREPARED BY A REGISTERED LAND SURVEYOR, REGISTERED IN THE STATE OF FLORIDA, AND SUBMITTED BY THE CONTRACTOR TO THE CITY. AS THE WORK PROGRESSES, THE ENGINEER OF RECORD (OR THEIR REPRESENTATIVE) SHALL RECORD ON ONE SET OF DRAWINGS THE LOCATION INCLUDING STATION AND OFFSET WITH SUFFICIENT DIMENSIONS AND DISTANCES TO ADEQUATELY DESCRIBE THE LOCATION OF THE IMPROVEMENT FROM THE BASELINE. ELEVATIONS ARE TO BE PROVIDED AT THE TOP OF PIPE AT INCREMENTS OF EVERY 100 FEET ON ALL WATER AND FORCE MAINS. STATIONING IS REQUIRED ON ALL VALVES, FITTINGS, WATER AND SEWER SERVICES AND FIRE HYDRANTS. THE LENGTHS OF ALL WATER SERVICE LINES AND SEWER LATERALS MUST BE NOTED ON GRAVITY SEWER LINES, ELEVATIONS AND STATIONING ARE TO BE INDICATED ON ALL MANHOLE RIMS AND INVERTS. THE DISTANCE BETWEEN MANHOLES IS TO BE SHOWN ON BOTH THE PLAN AND PROFILE SHEETS UNLESS PLAN VIEW AND PROFILE VIEW ARE ON THE SAME SHEET. THE ENGINEER OF RECORD IS TO SUBMIT TWO SETS OF BLUE PRINT RECORD OR AS–BUILT DRAWINGS AND ONE MYLAR TO THE ENGINEERING DEPARTMENT ALONG WITH THE HEALTH DEPARTMENT APPLICATION FOR RELEASE OF THE SYSTEM. ALL "AS–BUILT DRAWINGS" SHALL BE SIGNED SEALED AND DATED BY THE ENGINEER OF RECORD. CERTIFICATE OF OCCUPANCY WILL BE HELD UNTIL ACCEPTANCE BY HRS AND THE ENVIRONMENTAL SERVICES DEPARTMENT. PAVING & DRAINAGE AS–BUILT DRAWINGS SHALL INCLUDE RIM ELEVATIONS, INVERT ELEVATIONS, PIPE SIZES, CONTROL STRUCTURE DIMENSIONS, AS WELL AS, AS–BUILT ELEVATIONS AT EVERY LOCATION A PROPOSED ELEVATION IS INDICATED ON THE CONSTRUCTION PLAN. ADEQUATE AS–BUILT ELEVATIONS SHALL BE PROVIDED ON EMBANKMENTS TO DETERMINE COMPLIANCE WITH MAXIMUM SLOPE REQUIREMENTS.
16. PRIOR TO COMMENCEMENT OF ANY EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH FLORIDA STATUTE 553–851 FOR PROTECTION OF UNDERGROUND GAS PIPE LINES.
17. CONTRACTOR SHALL NOTIFY SUNSHINE STATE ONE (1–800–432–4770) 48 HOURS IN ADVANCE OF CONSTRUCTION.
18. GRADES SHOWN ON PLANS ARE FINISHED GRADES. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST EXISTING SANITARY SEWER MANHOLE TOPS AND VALVE BOX COVERS TO FINISHED GRADE.
19. CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AT ALL TIMES DURING CONSTRUCTION AND SHALL BE REQUIRED TO PROVIDE ALL BARRICADES, LIGHTING, SIGNAGE AND FLAGMEN AS NECESSARY TO PROVIDE FOR THE SAFETY OF THE PUBLIC IN THE WORK AREA.

... PROCEDURE CONTINUED

20. EXISTING BASE MATERIAL THAT IS REMOVED DURING CONSTRUCTION SHALL NOT BE USED IN THE CONSTRUCTION OF NEW LIMEROCK BASE.
21. VEGETATION, DEBRIS, CONCRETE OR OTHER UNSUITABLE MATERIAL SHALL BE LEGALLY DISPOSED OF OFF–SITE IN AN AREA AT THE CONTRACTORS EXPENSE.
22. CONTRACTOR SHALL UTILIZE CONSTRUCTION METHODS AND DEVICES, SUCH AS TURBIDITY SCREENS, CURTAINS AND FLOATING SILT BARRIERS WHERE NECESSARY IN ORDER TO COMPLY WITH ALL STATE AND LOCAL WATER QUALITY STANDARDS.
23. PRIOR TO AND DURING CONSTRUCTION OF ALL SITES, THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES INCLUDED IN A POLLUTION PREVENTION PLAN PROVIDED TO THE CITY OF DELRAY BEACH'S CHIEF BUILDING OFFICIAL.
24. REINFORCED CONCRETE STORM SEWER PIPE SHALL BE CLASS III, UNLESS OTHERWISE NOTED.
25. ALL PAVED SURFACES SHALL BE PROPERLY MARKED PRIOR TO HOURS OF DARKNESS AND FINAL PAVEMENT MARKINGS SHALL BE INSTALLED PRIOR TO ROADWAY OPENING TO TRAFFIC. NEWLY PLACED PAVEMENT SURFACES SHALL HAVE PAVEMENT MARKINGS INSTALLED PRIOR TO ROADWAY BEING OPENED TO TRAFFIC.
26. EMBANKMENT (FILL) AND EXCESS MATERIAL REQUIRED FOR ROADWAY RECONSTRUCTION AND UTILITY INSTALLATIONS SHALL BE SUPPLIED AND/OR DISPOSED OF BY THE CONTRACTOR. ALL COSTS ASSOCIATED WITH EARTHWORK REQUIREMENTS TO COMPLETE THE ROADWAY RECONSTRUCTION AND UTILITY IMPROVEMENTS SHALL BE INCLUDED IN THE COSTS OF OTHER APPROPRIATE PAY ITEMS.
27. CONTINUITY OF WATER AND SEWER SERVICE TO CITY UTILITY CUSTOMERS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THIS PROJECT. IF A DISRUPTION IN SERVICE IS UNAVOIDABLE TO ACCOMMODATE CONNECTION OF NEW FACILITIES, IT SHALL BE SCHEDULED FOR OFF PEAK HOURS WITH THE CITY. DETERMINATION OF SERVICE DISRUPTION REQUIREMENT WILL BE MADE BY THE CITY. THE CONTRACTOR SHALL NOTIFY THE CITY TO SCHEDULE INTERRUPTIONS WITH RESIDENTS.
28. SITE INFORMATION IS BASED ON A SURVEY PREPARED BY: WANTMAN GROUP, INC.

LAP SPECIFIC NOTES

1. ALL FDOT STANDARDS AND SPECIFICATIONS SHALL BE CALENDAR YEAR 2016, OR AS AMENDED IN THE SPECIFICATION PACKAGE.
2. ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITION.
3. ALL CROSSWALK SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346).
4. REFERENCE THE 2016 FDOT 600 SERIES FOR ALL REQUIRED AND APPLICABLE MOT PLANS.
5. ALL DETECTABLE WARNING SURFACE BRICK PAVERS SHALL BE COLOR "BRICK RED".
6. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3–12.
7. ALL CONCRETE SHALL COMPLY WITH FDOT LAP BIG 4 SPEC 344.
8. PULL BOXES LOCATED WITHIN SIDEWALK SHALL CONFORM TO STANDARD INDEX 17700.
9. ANY STEEL INCORPORATED INTO THIS PROJECT SHALL CONFORM TO BUY AMERICA PROVISION 23 CFR 635.410.
10. ALL WORK FOR THIS PROJECT WILL BE COMPLETED WITHIN AND FROM THE EXISTING RIGHT OF WAY.
11. THE DESIGN SPEED FOR THIS ROAD IS 30 MPH.
12. CONTRACTOR RESPONSIBLE TO REPLACE ALL TRAFFIC SIGNAL DETECTION LOOPS.
13. PRIOR TO MILLING AND RESURFACING, THE CONTRACTOR SHALL PROVIDE THE CITY A LISTING, COMPLETE WITH STATIONS, OFFSETS, AND PHOTOS OF ALL EXISTING MANHOLES AND VALVE COVERS LOCATED WITHIN THE EXISTING PAVEMENT. UPON COMPLETION OF MILLING AND RESURFACING THE CONTRACTOR SHALL PROVIDE EVIDENCE TO THE CITY THAT ALL OF THE EXISTING MANHOLE AND/OR VALVE COVERS ARE STILL VISIBLE DURING FINAL INSPECTION.
14. IF THE CONTRACTOR ENCOUNTERS AN EXISTING VALVE BOX THAT IS OUT OF PLUMB, THE CONTRACTOR SHALL COORDINATE WITH THE CITY TO ADJUST THE VALVE BOX AT THE PRE–CONSTRUCTION MEETING.
15. IF SUSPECT CONTAMINATED OR HAZARDOUS MATERIAL IS FOUND ON THE PROJECT OR ENCOUNTERED DURING CONSTRUCTION THE CONTRACTOR SHALL CEASE OPERATIONS IN THAT AREA. IMMEDIATELY NOTIFY THE CITY ENGINEER ISAAC KOVNER AT (561) 243–7060 AND PROTECT THE IMMEDIATE AREA OF SUSPECT CONTAMINATED OR HAZARDOUS MATERIAL FROM FURTHER ACCESS. THE CITY ENGINEER WILL ARRANGE FOR THE INVESTIGATION, IDENTIFICATION AND/OR REMOVAL/REMEDIATION OF THE MATERIAL IN QUESTION AS NEEDED.
16. THE CONTRACTOR SHALL NOT BRING ANY HAZARDOUS MATERIALS ONTO THE PROJECT. SHOULD THE CONTRACTOR REQUIRE SUCH FOR PERFORMING THE CONTRACTED WORK, THE CONTRACTOR SHALL REQUEST, IN WRITING, WRITTEN PERMISSION FROM THE PROJECT ENGINEER. THE CONTRACT SHALL PROVIDE A COPY OF THE REQUEST TO THE CITY ENGINEER. THE CONTRACTOR SHALL PROVIDE CITY ENGINEER WITH A COPY OF THE MATERIAL SAFETY DATA SHEET (MSDS) FOR EACH HAZARDOUS MATERIAL PROPOSED FOR EACH USE, AND PROVIDE A DESCRIPTION OF THE SPECIFIC MANNER IN WHICH THE MATERIAL WILL BE USED. THE PROJECT ENGINEER SHALL COORDINATE WITH THE CITY ENGINEER PRIOR TO ISSUING WRITTEN APPROVAL TO THE CONTRACTOR. BECAUSE STATE LAW DOES NOT TREAT PETROLEUM PRODUCTS THAT RARE PROPERLY CONTAINERIZED AS HAZARDOUS MATERIALS, SUCH PRODUCTS DO NOT REQUIRE AN MSDS SUBMITTAL. ALL BULK PETROLEUM PRODUCTS STORED ON SITE SHALL REQUIRE PROPER STORAGE WHICH INCLUDES SECONDARY CONTAINMENT.

UTILITY CONTACTS

CITY OF DELRAY BEACH WATER/SEWER
ISAAC KOVNER, PE
CITY ENGINEER
434 S. SWINTON AVENUE
DELRAY BEACH, FL 33444
(561) 243–7060

AT&T
GARTH BEDWARD
2021 S MILITARY TRAIL
WEST PALM BEACH, FL 33415
GARTH.BEDWARD@ATT.COM
PHONE 561–540–9263
CELL 561–329–5451

COMCAST
STEPHEN ROSA
7201 N. FEDERAL HIGHWAY
BOCA RATON, FL 33407
PHONE 561–454–5851

FLORIDA POWER AND LIGHT
JOHN VAN VLEET
9329 S. MILITARY TRAIL
BOYNTON BEACH, FL 33436
(561) 742–2003

FLORIDA PUBLIC UTILITIES CORP.
IVAN GIBBS
209 N. SAPODILLA AVENUE
WEST PALM BEACH, FL 33401
(561) 723–3459

PALM BEACH COUNTY TRAFFIC OPERATIONS SUPERINTENDENT
2300 JOG ROAD
WEST PALM BEACH, FL 33411–2747
PHONE 561–681–4371

TECO
MAX CHAMORRO
5101 NW 21 AVENUE, STE 460
FT LAUDERDALE, FL 33309

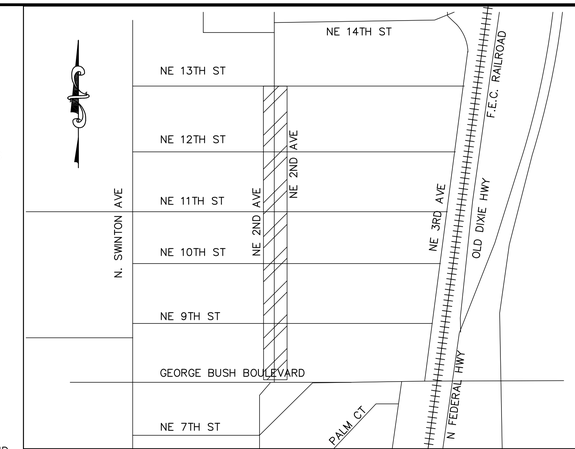
GENERAL NOTES

1. REGULATIONS – ALL CONSTRUCTION SHALL BE DONE IN A WORKMAN LIKE MANNER AND SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL REGULATIONS AND OR CODES INCLUDING BUT NOT LIMITED TO THE CURRENT PALM BEACH COUNTY AND FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) LATEST REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND LICENSES TO BEGIN WORK AND PAY ALL REQUIRED FEES ASSOCIATED WITH SAME.
2. VERTICAL DATUM – ELEVATIONS REFER TO N.G.V.D. 1929 AS PER TOPOGRAPHIC SURVEY BENCHMARK INFORMATION PROVIDED PALM BEACH COUNTY "Z 233" HAVING AN ELEVATION OF 17.570 (NGVD29).
3. HORIZONTAL DATUM – NORTH AMERICAN DATUM 1983, FLORIDA STATE PLANE COORDINATES, EAST ZONE, FOOT.
4. GUARANTEE – THE CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIAL FOR A PERIOD OF ONE YEAR FROM THE DATE OF PROJECT ACCEPTANCE, DURING WHICH ALL FAULTY CONSTRUCTION AND/OR MATERIAL SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
5. RESTORATION – THE CONTRACTOR SHALL IMMEDIATELY REPAIR AND RESTORE EXISTING SITE FEATURES INCLUDING PAVEMENT, DRIVEWAYS, PIPES, FENCES, TRAFFIC CONTROL DEVICES, MAILBOXES AND PROPERTY CORNERS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES. THE REPAIR AND RESTORATION SHALL CONFORM TO APPLICABLE STANDARDS AS GOVERNED.
6. THE CONTRACTOR SHALL NOT STAGE OR OPERATE EQUIPMENT WITHIN THE DRIP LINE OF TREES.
7. ALL LANDSCAPE AND TREES WITHIN THE CITY R/W SHALL BE REMOVED.
8. ALL CONNECTIONS TO EXISTING SIDEWALK SHALL MATCH EXISTING GRADE AND ELEVATION.
9. CONTRACTOR SHALL SUBMIT A LANDSCAPE IRRIGATION PLAN FOR THE LANDSCAPE MODIFICATION TO THE TRAFFIC ISLAND AT GEORGE BUSH BOULEVARD AND NE 2ND AVENUE.
10. THE CONTRACTOR SHALL COORDINATE AND REVIEW OF ANY PROPOSED STAGING AREAS ASSOCIATED WITH THIS PROJECT WITH THE CITY ENGINEER AT 561–243–7060, AND THE FDOT ENVIRONMENTAL COORDINATOR AT 954–777–4665.
11. VIBRATORY COMPACTION MONITORING SHALL BE IN ACCORDANCE WITH FDOT SPECIFICATION 108
12. THE CONTRACTOR IS REQUIRED TO INCLUDE AN ADD ALTERNATIVE FOR 2.5" MILLING AND RESTORATION OF THE EXISTING PAVEMENT IN ACCORDANCE SPECIFICATION 341 AND THE FDOT FLEXIBLE PAVEMENT DESIGN MANUAL FOR ASPHALT RUBBER MEMBRANE INTERLAYER (ARMI) FOR MINIMUM 1.5" OVERLAY (2–0.75" LIFTS).

PAVEMENT MARKING LEGEND

- (A) 6" WHITE SOLID
- (C) 6" WHITE 2'–4' DOTTED
- (D) 12" WHITE
- (E) 24" WHITE
- (F) 6" DOUBLE YELLOW WITH RPMS
- (G) 6" SKIP WHITE 6'–10'
- (H) 6" DOUBLE YELLOW
- (J) 18" SOLID WHITE
- (K) 8" SOLID WHITE
- (L) FLEXIBLE DELINEATOR POST WHITE
- (M) RPM BI–DIRECTIONAL WHITE/RED

NOTE:
SEE DETAIL RT3.2 FOR TRAFFIC CONTROL STOP CONDITIONS AT INTERSECTIONS



KEY MAP
SCALE : NONE

LEGEND

PROP. ELEVATION (0.00)
EXIST. ELEVATION x0.00
DIRECTION OF FLOW
STREET/STOP/TRAFFIC SIGN
EXIST. BACKFLOW PREVENTER (BF)
EXIST. BOLLARD (B)
EXIST. CLEANOUIT (⊗)
EXIST. FIRE HYDRANT FHD
EXIST. FLOOD LIGHT
EXIST. GATE VALVE
EXIST. SANITARY MANHOLE (S)
EXIST. METER WATER/ELECTRIC M E
EXIST. POWER POLE
EXIST. DRAINAGE — — — D — —
EXIST. OVERHEAD LINES — — — OH — —
EXIST. OVERHEAD UTILITIES — — — OHU — —
EXIST. SANITARY — — — S — —
EXIST. TELEPHONE — — — BT — —
EXIST. WATERMAIN — — — W — —

PROPOSED ELEVATION (20.00)

PROP. 4" THICK CONCRETE (REMOVE & REPLACE)
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)
PROP. 6" THICK CONCRETE (SIDEWALK)
PROP. 6" THICK CONCRETE (DRIVEWAY)
PAVER BRICK CROSSWALK BID–ALTERNATE
PROPOSED RECONSTRUCTED SHOULDER
PROP. LIMITS OF MILL AND RESURFACE 1"
PROP. SWALE REGRADING
PROP. GREEN BIKE LANE SURFACE

ABBREVIATIONS

BT	BURIED TELEPHONE
CB	CATCH BASIN
℄	CENTER LINE
CI	CURB INLET
CO	CLEANOUT
CS	CONTROL STRUCTURE
D	DRAINAGE MANHOLE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EX,EXIST	EXISTING
FH	FIRE HYDRANT
I	INLET
INV	INVERT
M	MANHOLE
MB	MAIL BOX
OE	OVERHEAD ELECTRIC
OHU	OVERHEAD UTILITY
OS	OFFSET
PBC	PALM BEACH COUNTY
PROP	PROPOSED
R/W	RIGHT OF WAY
S	SEWER MANHOLE
STA	STATION
SW	SIDEWALK
TYP	TYPICAL
W	WATER METER
WPP	WOOD POWER POLE
WV	WATER VALVE

WGI
2035 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6991 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

NO.	DATE	REVISIONS DESCRIPTION	BY

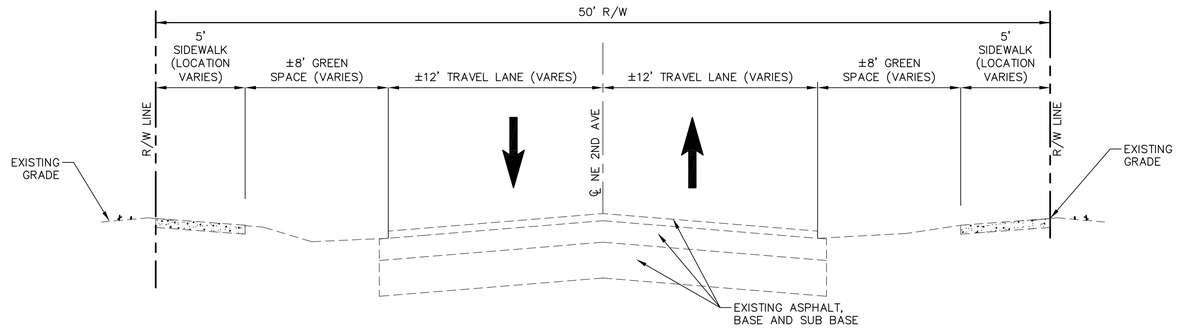
CAD NE2_GN.DWG			
JOB NO. 1004.11	DRAWN	SCC	
TOTAL SHEETS 28	DESIGNED	SCC	
DATE 8/18/2016	CHECKED	BNO	
SCALE NONE	QC	JWR	

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
GENERAL NOTES

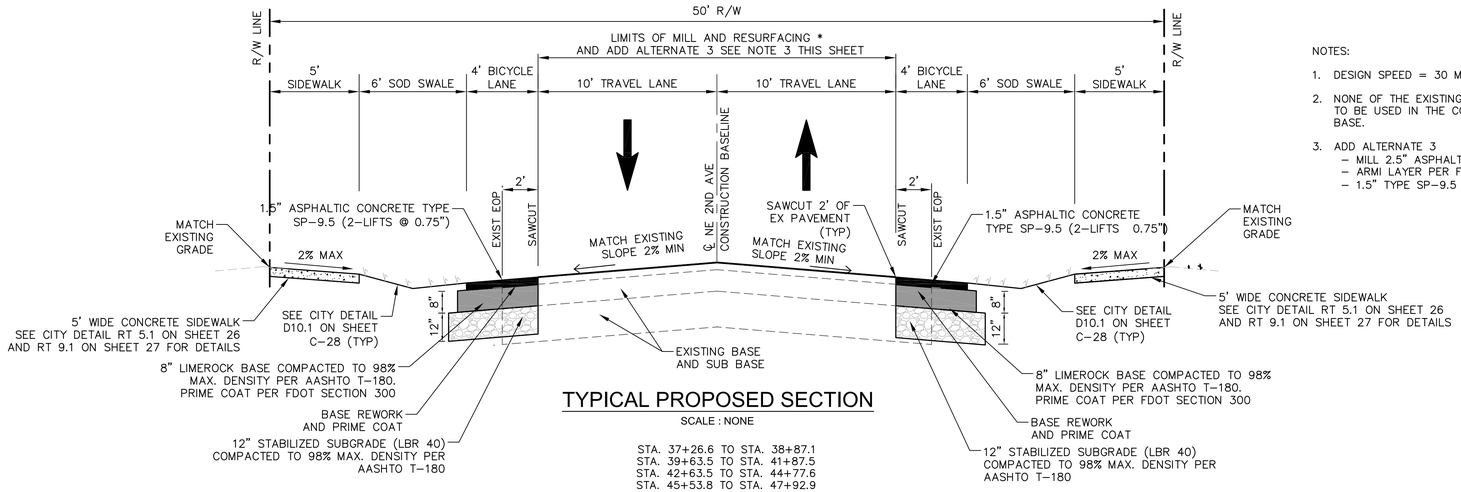
SHEET:
C-2



TYPICAL EXISTING SECTION

SCALE : NONE

STA. 37+26.6 TO STA. 38+87.1
STA. 39+63.5 TO STA. 41+87.5
STA. 42+63.5 TO STA. 44+77.6
STA. 45+53.8 TO STA. 47+92.9
STA. 48+68.9 TO STA. 51+32.8
STA. 52+09.5 TO STA. 53+00.0



TYPICAL PROPOSED SECTION

SCALE : NONE

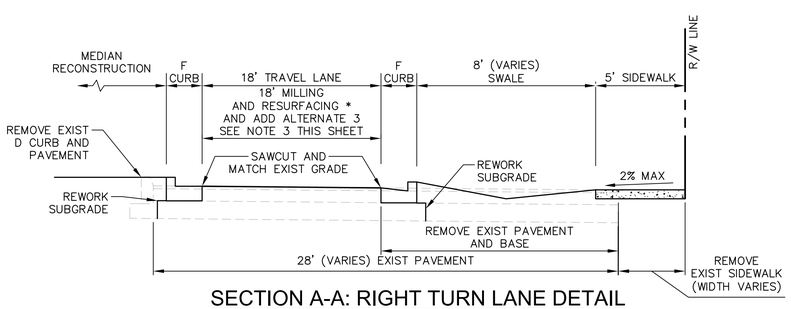
STA. 37+26.6 TO STA. 38+87.1
STA. 39+63.5 TO STA. 41+87.5
STA. 42+63.5 TO STA. 44+77.6
STA. 45+53.8 TO STA. 47+92.9
STA. 48+68.9 TO STA. 51+32.8
STA. 52+09.5 TO STA. 53+00.0

MILLING
* MILL EXISTING ASPHALT PAVEMENT (1.0")
AREAS REQUIRING VARIABLE MILLING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION

RESURFACING
* TYPE SP-9.5 ASPHALT (1.0")
AREAS REQUIRING VARIABLE RESURFACING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION

NOTES:

1. DESIGN SPEED = 30 MPH.
2. NONE OF THE EXISTING BASEROCK BASE THAT IS REMOVED IS TO BE USED IN THE CONSTRUCTION OF THE NEW BASEROCK BASE.
3. ADD ALTERNATE 3
   - MILL 2.5" ASPHALT
   - ARMI LAYER PER FDOT SPECIFICATION 341
   - 1.5" TYPE SP-9.5 ASPHALTIC CONCRETE (2-LIFTS 0.75")

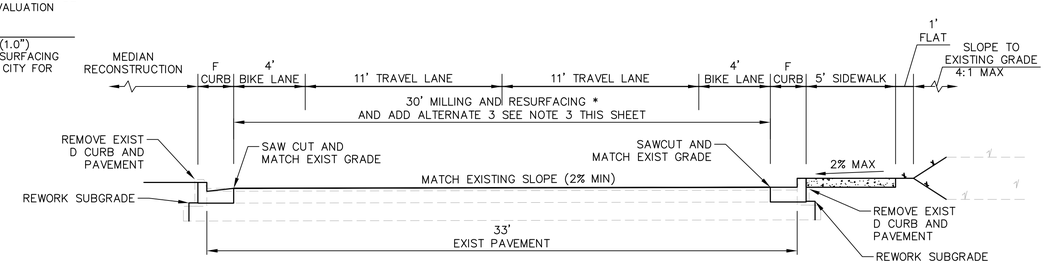


SECTION A-A: RIGHT TURN LANE DETAIL
SEE SHEET C-7

STA. 36+37.8 TO STA. 37+26.6

MILLING
* MILL EXISTING ASPHALT PAVEMENT (1.0")
AREAS REQUIRING VARIABLE MILLING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION

RESURFACING
* TYPE SP-9.5 ASPHALT (1.0")
AREAS REQUIRING VARIABLE RESURFACING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION



SECTION B-B: TWO DIRECTIONAL LANE DETAIL
SEE SHEET C-7

STA. 36+37.8 TO STA. 37+26.6

MILLING
* MILL EXISTING ASPHALT PAVEMENT (1.0")
AREAS REQUIRING VARIABLE MILLING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION

RESURFACING
* TYPE SP-9.5 ASPHALT (1.0")
AREAS REQUIRING VARIABLE RESURFACING SHOULD BE BROUGHT TO THE CITY FOR EVALUATION

WGI
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Fax No. 561.687.1110
Cert No. 6991 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

REVISIONS

NO.	DATE	DESCRIPTION	BY

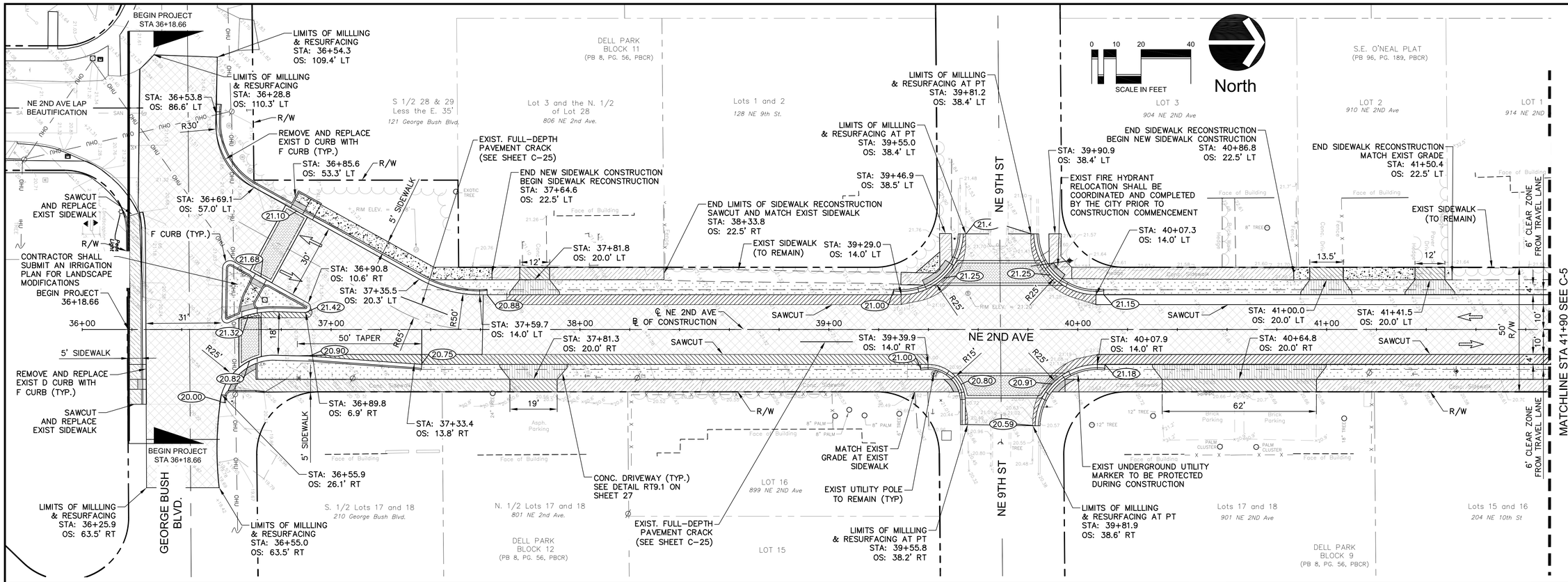
CAD FILE: 2_TYP.DWG	DRAWN	SCC	
JOB NO. 1004.11	DESIGNED	SCC	
TOTAL SHEETS 28	CHECKED	BNO	
DATE 8/18/2016	QC	JWR	
SCALE N/A			

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: TYPICAL SECTIONS

SHEET: C-3



NOTES:

1. ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITION.
2. ALL CROSSWALK SIGNS AND ADVANCED PAVEMENT MESSAGES SHALL BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346).
3. REFERENCE THE 2016 FDOT 600 SERIES FOR ALL REQUIRED AND APPLICABLE MOT PLANS.
4. ALL DETECTABLE BRICK PAVERS SHALL BE COLOR "BRICK RED".
5. CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
6. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3-12
7. CONTRACTOR RESPONSIBLE TO REPLACE ALL TRAFFIC LOOPS.
8. ANY STEEL INCORPORATED INTO THIS PROJECT SHALL CONFORM TO BUY AMERICA PROVISION 23 CFR 635.410.
9. ALL WORK FOR THIS PROJECT WILL BE COMPLETED WITHIN AND FROM THE EXISTING RIGHT OF WAY.
10. THE DESIGN SPEED FOR THIS ROAD IS 30 MPH.
11. CITY OF DELRAY BEACH SHALL BE RESPONSIBLE FOR COORDINATING THE REMOVAL OF PRIVATE LANDSCAPE AND ABOVE GROUND APPURTENANCES BEFORE CONSTRUCTION BEGINS.

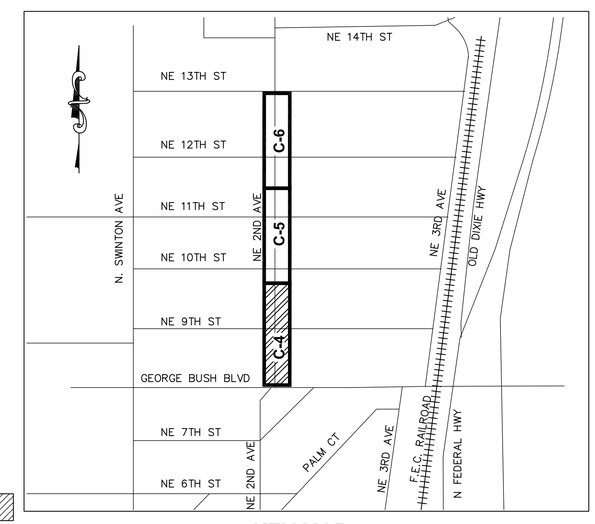
LEGEND

EXIST. ELEVATION x 0.00
DIRECTION OF FLOW
STREET/STOP SIGN
EXIST. BACKFLOW PREVENTER
EXIST. BOLLARD
EXIST. CLEANOUIT
EXIST. FIRE HYDRANT
EXIST. FLOOD LIGHT
EXIST. GATE VALVE
EXIST. SANITARY MANHOLE
EXIST. METER WATER/ELECTRIC
EXIST. POWER POLE
EXIST. DRAINAGE — — — D — —
EXIST. OVERHEAD LINES — — — OH — —
EXIST. SANITARY — — — S — —
EXIST. TELEPHONE — — — BT — —
EXIST. WATERMAIN — — — W — —
PROP. 4" THICK CONCRETE (REMOVE & REPLACE)
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)
PROP. 6" THICK CONCRETE (SIDEWALK)
PROP. 6" THICK CONCRETE (DRIVEWAY)
PROP. SWALE REGRADING

ABBREVIATIONS

BT	BURIED TELEPHONE
CB	CATCH BASIN
℄	CENTER LINE
CI	CURB INLET
CO	CLEANOUT
CR	CURB RAMP
CS	CONTROL STRUCTURE
D	DRAINAGE MANHOLE
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EX	EXISTING
FH	FIRE HYDRANT
I	INLET
INV	INVERT
M	MANHOLE
MB	MAIL BOX
OE	OVERHEAD ELECTRIC
OHU	OVERHEAD UTILITY
OS	OFFSET
PBC	PALM BEACH COUNTY
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
R/W	RIGHT OF WAY
S	SEWER MANHOLE
STA	STATION
SW	SIDEWALK
TYP	TYPICAL
W	WATER METER
WPP	WOOD POWER POLE
WV	WATER VALVE

PROPOSED RECONSTRUCTED SHOULDER
PROP. LIMITS OF MILL AND RESURFACE 1"
PROP. PAVER BRICK CROSSWALK



KEY MAP
SCALE : NONE

WGI
2035 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6991 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

NO.	DATE	REVISIONS DESCRIPTION	BY

CAD NE2_RD PLANS.DWG	
JOB NO. 1004.11	DRAWN SCC
TOTAL SHEETS 22	DESIGNED SCC
DATE 5/4/2017	CHECKED BNO
SCALE 1" = 20'	QC JWR

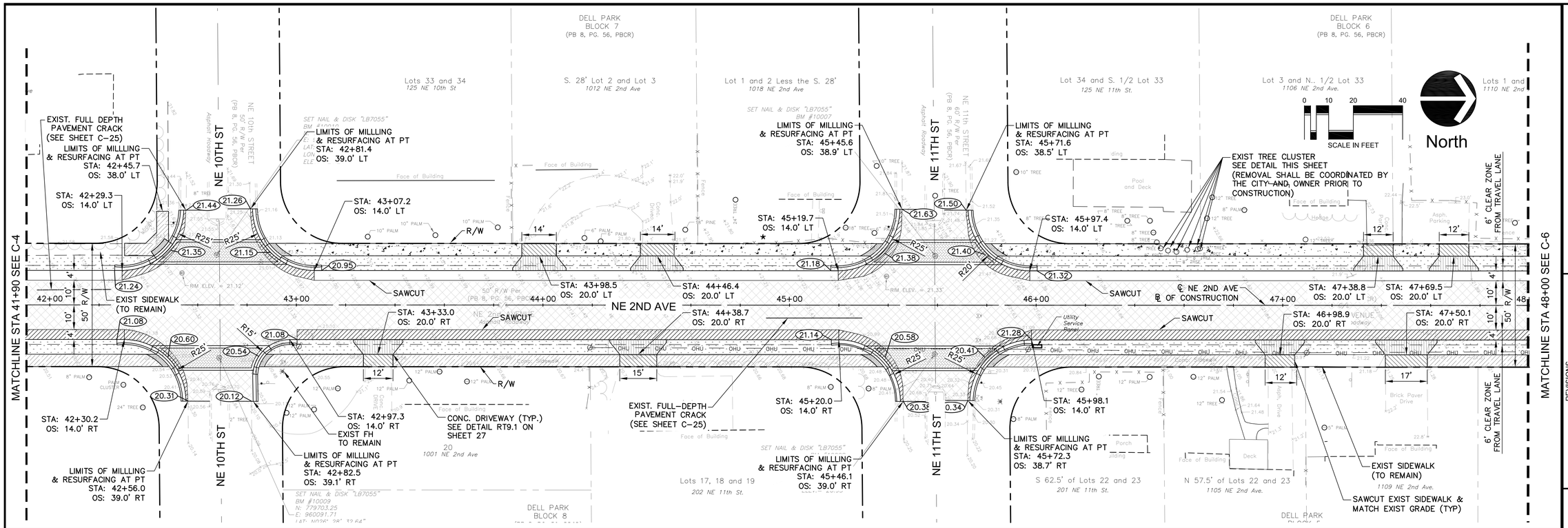
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

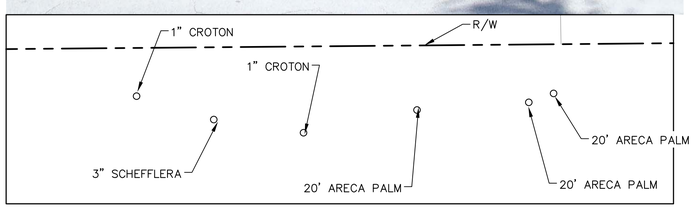
PROJECT: NE 2ND AVENUE / SEACREST PHASE 1
TASK: ROADWAY IMPROVEMENT PLAN

SHEET: C-4

811 Know what's below. Call before you dig.

Stephen Cherry C:\pwworking\wgi\stephen\ams36628\ne2_RD PLANS.dwg use Plotted: 5/4/2017 8:36:58 AM Saved: 5/4/2017 8:34:58 AM





TREE REMOVAL DETAIL

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LEGEND

- EXIST. ELEVATION — x0.00
- DIRECTION OF FLOW
- STREET/STOP SIGN
- EXIST. BACKFLOW PREVENTER — BP
- EXIST. BOLLARD — B
- EXIST. CLEANOUIT
- EXIST. FIRE HYDRANT — HYD
- EXIST. FLOOD LIGHT
- EXIST. GATE VALVE
- EXIST. SANITARY MANHOLE — S
- EXIST. METER WATER/ELECTRIC — M E
- EXIST. POWER POLE
- EXIST. DRAINAGE — D
- EXIST. OVERHEAD LINES — OH
- EXIST. SANITARY — S
- EXIST. TELEPHONE — BT
- EXIST. WATERMAIN — W
- PROP. 4" THICK CONCRETE (REMOVE & REPLACE)
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ABBREVIATIONS

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FH	FIRE HYDRANT
I	INLET
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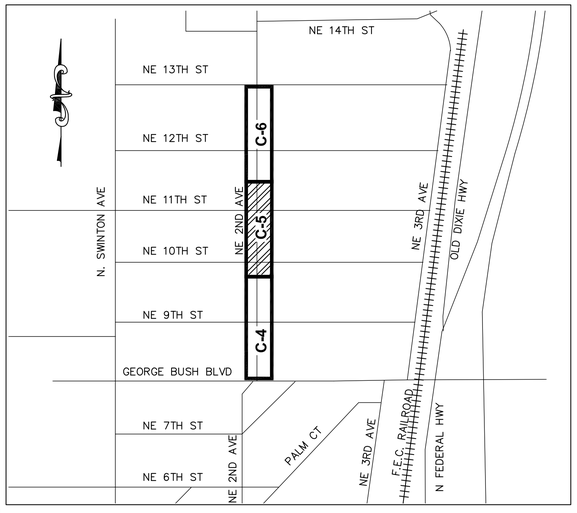
- PROPOSED RECONSTRUCTED SHOULDER
- PROP. LIMITS OF MILL AND RESURFACE 1"
- PROP. PAVER BRICK CROSSWALK



KEY MAP

SCALE : NONE

811 Know what's below. Call before you dig.

WGI
2035 Vista Parkway
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Fax No. 561.687.1110
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ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

NO.	DATE	REVISIONS DESCRIPTION	BY

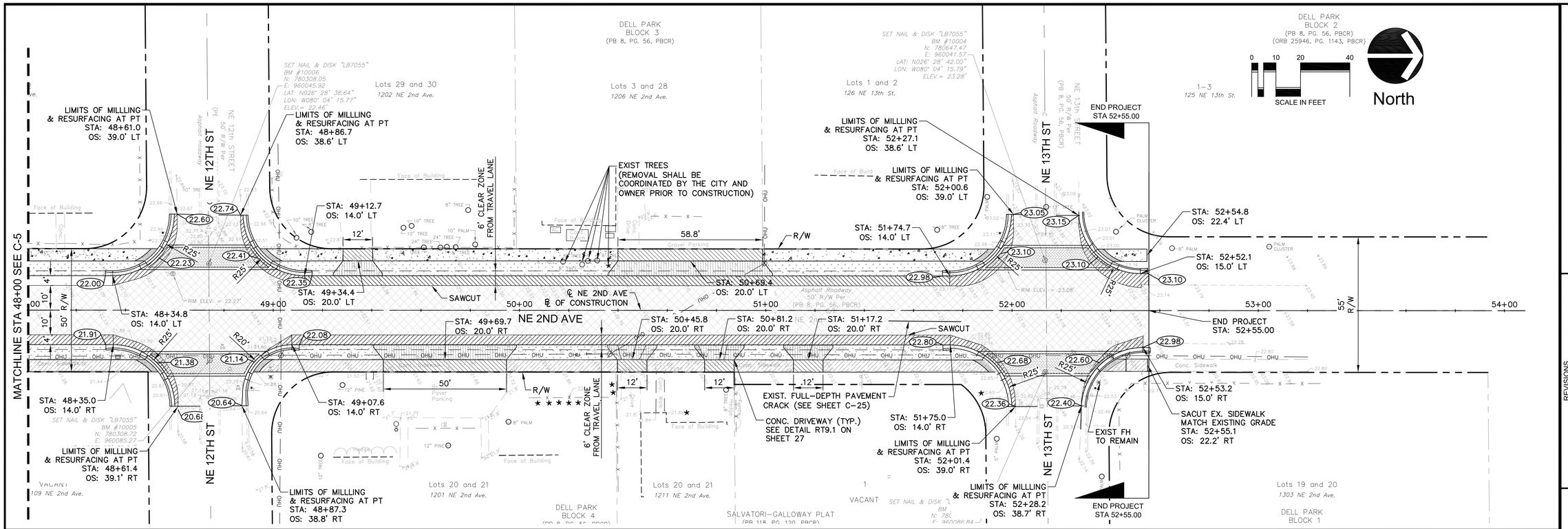
CAD NE2_RD PLANS.DWG	
JOB NO. 1004.11	DRAWN SCC
TOTAL SHEETS 23	DESIGNED SCC
DATE 5/4/2017	CHECKED BNO
SCALE 1" = 20'	QC JWR

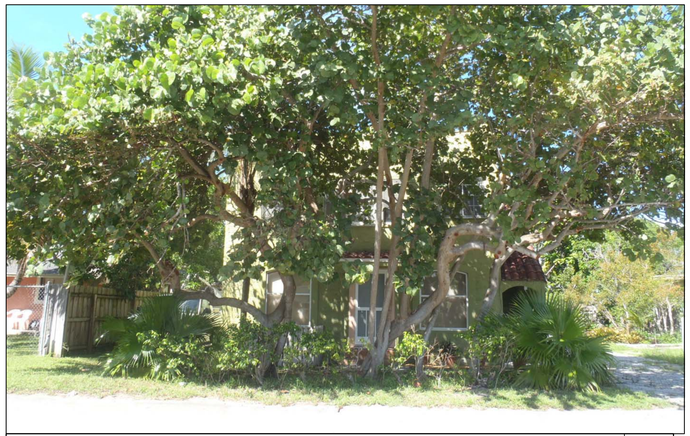
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

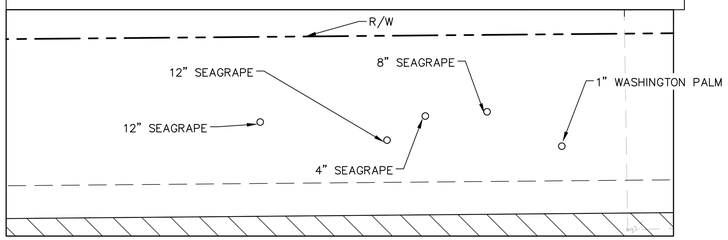
PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: ROADWAY IMPROVEMENT PLAN

SHEET: C-5







TREE REMOVAL DETAIL

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LEGEND

EXIST. ELEVATION	x0.00
DIRECTION OF FLOW	
STREET/STOP SIGN	
EXIST. BACKFLOW PREVENTER	BP
EXIST. BOLLARD	B
EXIST. CLEANOUIT	
EXIST. FIRE HYDRANT	FHD
EXIST. FLOOD LIGHT	
EXIST. GATE VALVE	
EXIST. SANITARY MANHOLE	S
EXIST. METER WATER/ELECTRIC	M E
EXIST. POWER POLE	
EXIST. DRAINAGE	D
EXIST. OVERHEAD LINES	OH
EXIST. SANITARY	S
EXIST. TELEPHONE	BT
EXIST. WATERMAIN	W
PROP. 4" THICK CONCRETE (REMOVE & REPLACE)	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)	
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PROP. SWALE REGRADING	

ABBREVIATIONS

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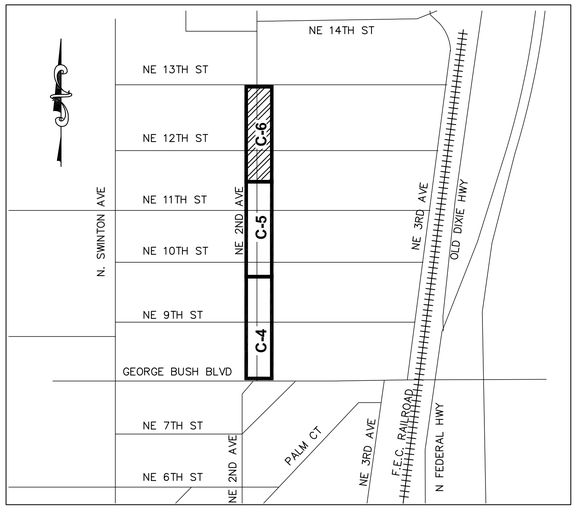
PROPOSED RECONSTRUCTED SHOULDER

PROP. LIMITS OF MILL AND RESURFACE 1"

PROP. PAVER BRICK CROSSWALK



KEY MAP

SCALE : NONE

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WGI
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ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

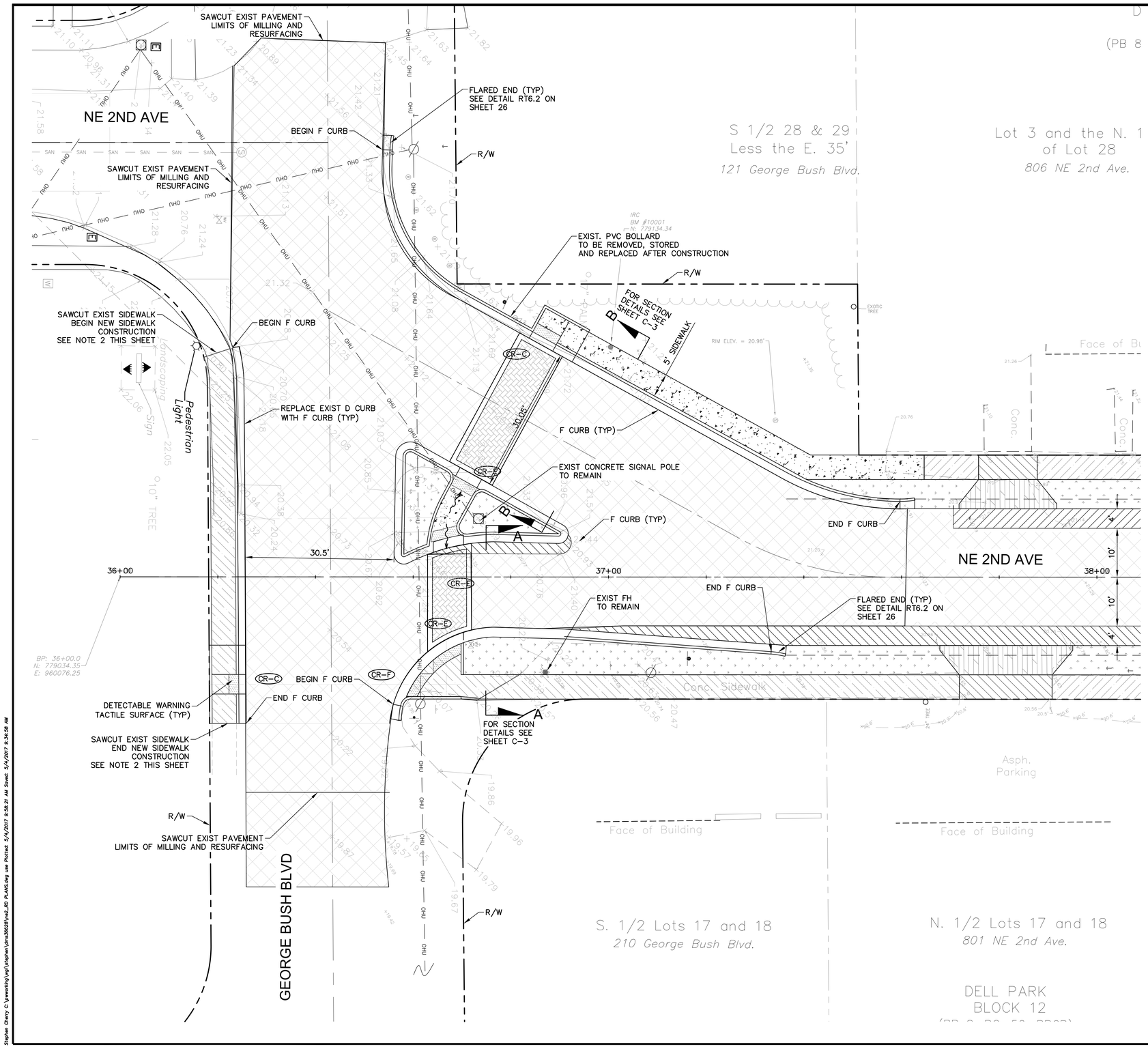
REVISIONS		
NO.	DATE	DESCRIPTION	BY

CAD NE2_RD PLANS.DWG
JOB NO. 1004.11
TOTAL SHEETS 23
DATE 5/4/2017
SCALE 1" = 20'
DRAWN SCC
DESIGNED SCC
CHECKED BNO
QC JWR

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1
TASK: ROADWAY IMPROVEMENT PLAN

SHEET: C-6



PROP. 4" THICK CONCRETE (REMOVE & REPLACE)		PROPOSED RECONSTRUCTED SHOULDER	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)		PROP. LIMITS OF MILL AND RESURFACE 1"	
PROP. 6" THICK CONCRETE (SIDEWALK)		PROP. SWALE REGRADING	
PROP. 6" THICK CONCRETE (DRIVEWAY)		PROP. PAVER BRICK CROSSWALK	

NOTES:

1. REFERENCE THE 2016 FDOT INDEX 304 FOR CURB RAMP DETAILS.
2. SIDEWALK RECONSTRUCTION SHALL EXTEND 10' MIN OR TO THE NEAREST JOINT
3. ALL DETECTABLE BRICK PAVERS SHALL BE COLOR "BRICK RED".
4. CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
5. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3-12
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Fax No. 561.687.1110
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REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD NE2_RD PLANS.DWG		DRAWN	SCC
JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS 23		CHECKED	BNO
DATE 5/4/2017		QC	JWR
SCALE 1" = 10'			

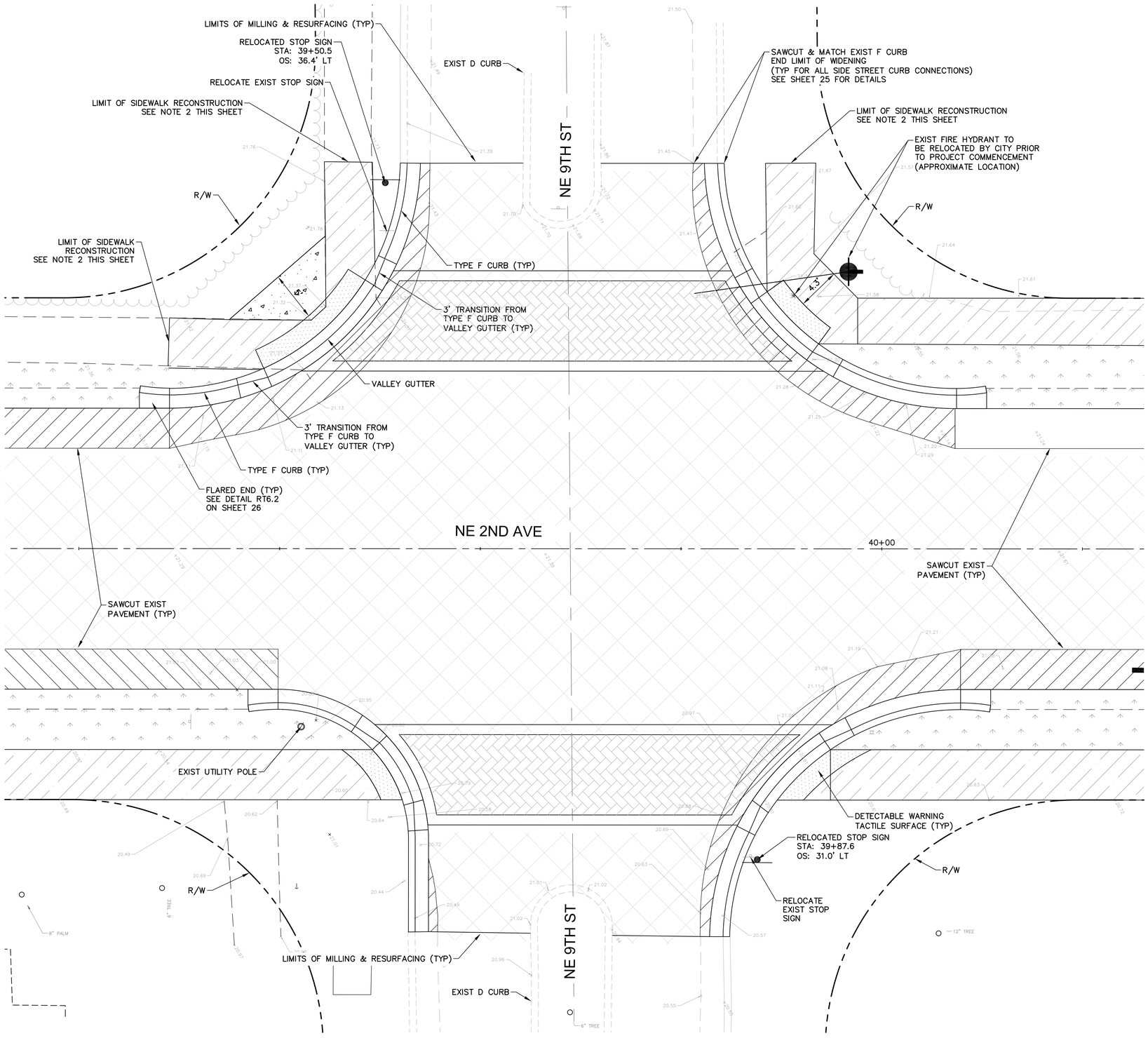
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: INTERSECTION DETAILS GEORGE BUSH BLVD.

SHEET: C-7

Stephen Cherry C:\pwworking\wgi\sfephen\dms36628\nea2_RD PLANS.dwg use Plotted: 5/4/2017 8:38:21 AM Saved: 5/4/2017 8:34:58 AM



North

0 2.5 5 10

PROP. 4" THICK CONCRETE (REMOVE & REPLACE)		PROPOSED RECONSTRUCTED SHOULDER	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)		PROP. LIMITS OF MILL AND RESURFACE 1"	
PROP. 6" THICK CONCRETE (SIDEWALK)		PROP. SWALE REGRADING	
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REVISIONS			
NO.	DATE	DESCRIPTION	BY

CAD NE2_RD PLANS.DWG		DRAWN	SCC
JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS	23	CHECKED	BNO
DATE	5/4/2017	QC	JWR
SCALE	1" = 5'		

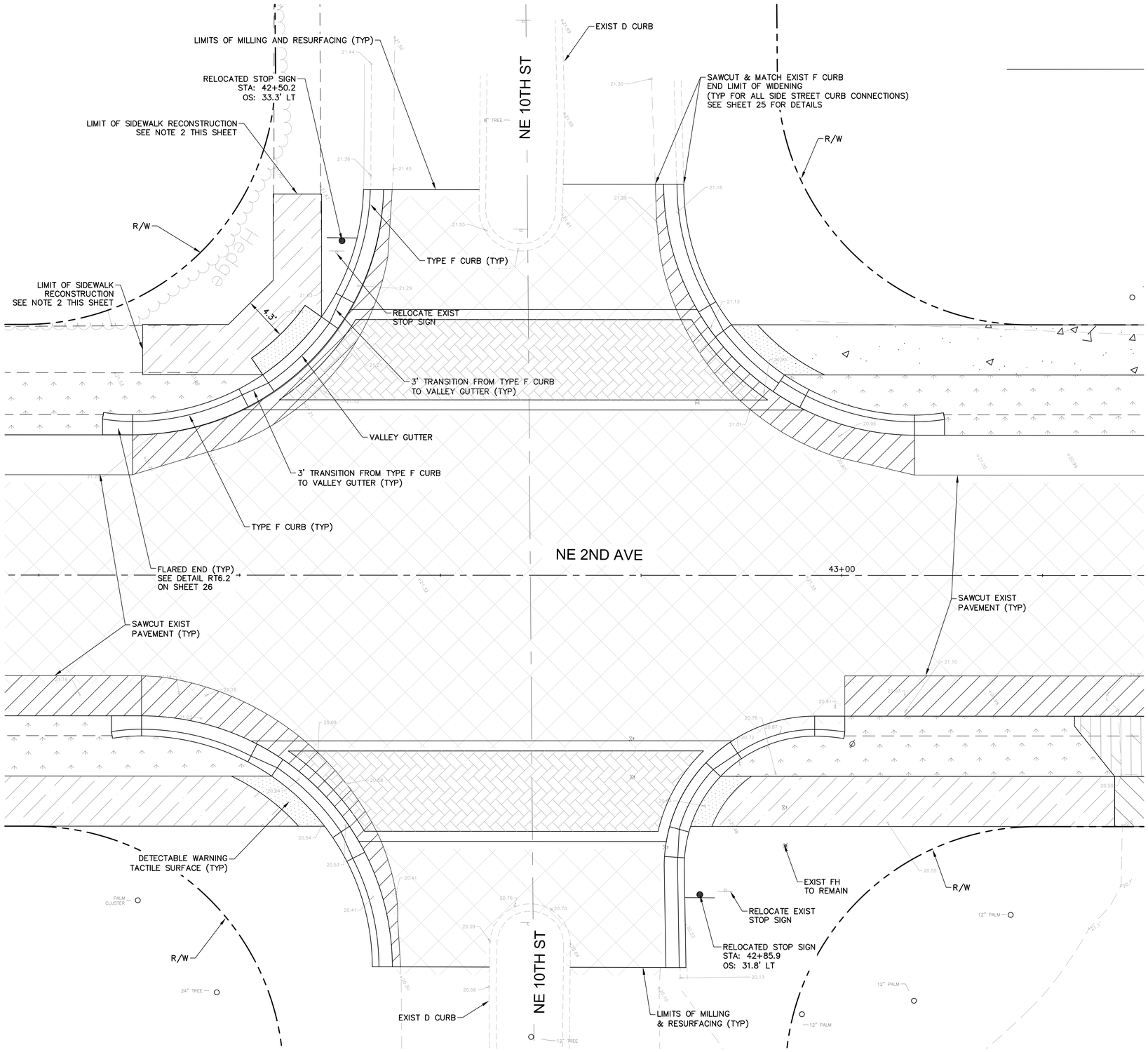
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: INTERSECTION DETAILS NE 9TH STREET

SHEET: C-8

Stephen Cherry C:\pwworking\wgi\sfeplan\jms36628\nea2_RD PLANS.dwg use Plotted: 5/4/2017 8:38:38 AM Saved: 5/4/2017 8:34:58 AM



North

0 2.5 5 10

PROP. 4" THICK CONCRETE (REMOVE & REPLACE)		PROPOSED RECONSTRUCTED SHOULDER	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)		PROP. LIMITS OF MILL AND RESURFACE 1"	
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2035 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6991 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD NE2_RD PLANS.DWG

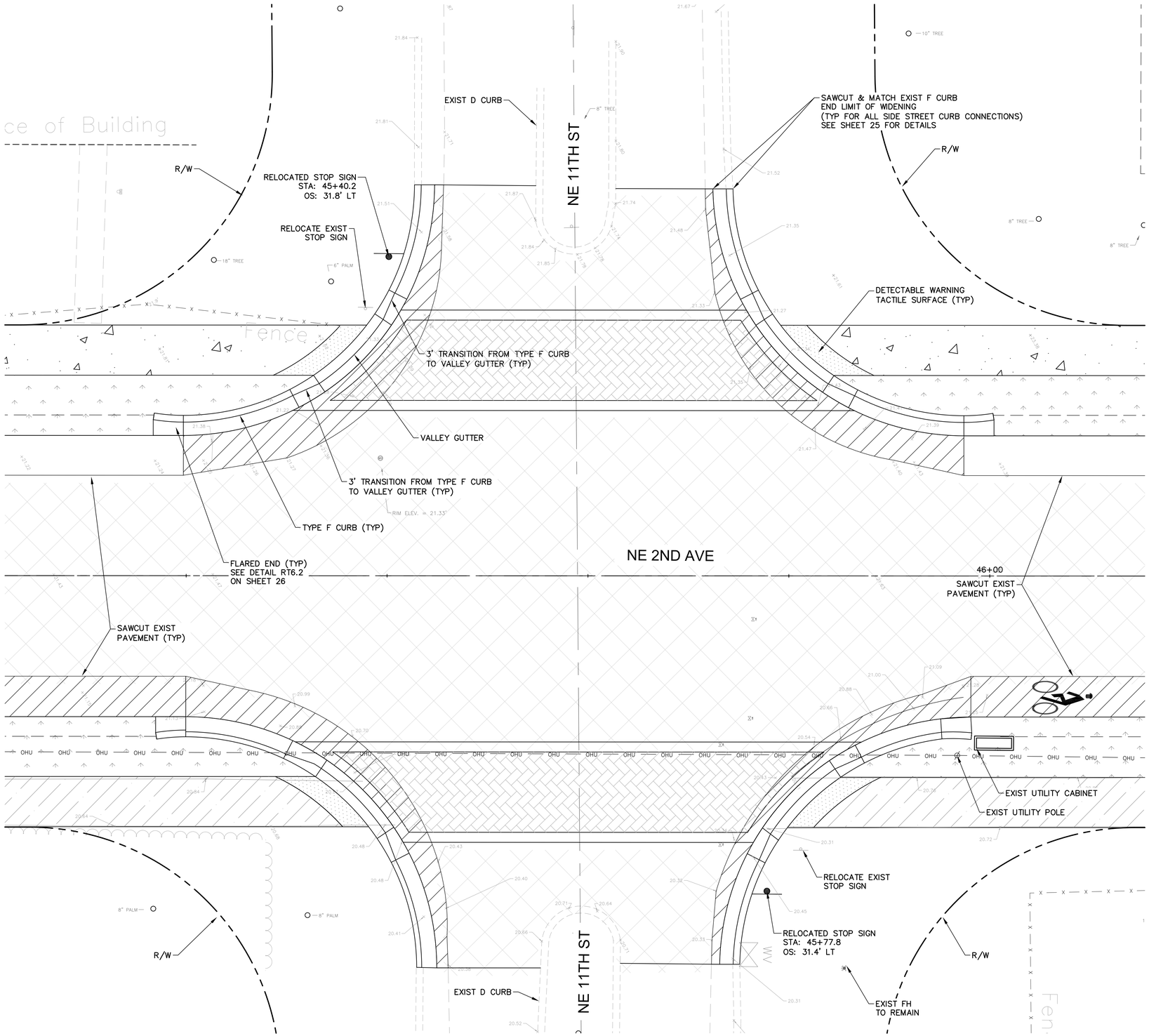
JOB NO. 1004.11	DRAWN	SCC	
TOTAL SHEETS 23	DESIGNED	SCC	
DATE 5/4/2017	CHECKED	BNO	
SCALE 1" = 5'	QC	JWR	

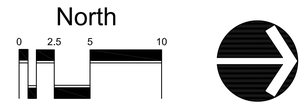
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
INTERSECTION DETAILS
NE 10TH STREET

SHEET:
C-9





PROP. 4" THICK CONCRETE (REMOVE & REPLACE)	PROPOSED RECONSTRUCTED SHOULDER
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)	PROP. LIMITS OF MILL AND RESURFACE 1"
PROP. 6" THICK CONCRETE (SIDEWALK)	PROP. SWALE REGRADING
PROP. 6" THICK CONCRETE (DRIVEWAY)	PROP. PAVER BRICK CROSSWALK

NOTES:

1. REFERENCE THE 2016 FDOT INDEX 304 FOR CURB RAMP DETAILS.
2. SIDEWALK RECONSTRUCTION SHALL EXTEND 10' MIN OR TO THE NEAREST JOINT
3. ALL DETECTABLE BRICK PAVERS SHALL BE COLOR "BRICK RED".
4. CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
5. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3-12
6. CONTRACTOR RESPONSIBLE TO REPLACE ALL TRAFFIC LOOPS.
7. ANY STEEL INCORPORATED INTO THIS PROJECT SHALL CONFORM TO BUY AMERICA PROVISION 23 CFR 635.410.
8. ALL WORK MUST BE PERFORMED COMPLETELY WITHIN THE CITY'S RIGHT-OF-WAY.
9. THE DESIGN SPEED FOR THIS ROAD IS 30 MPH.

Know what's **below.**
Call before you dig.

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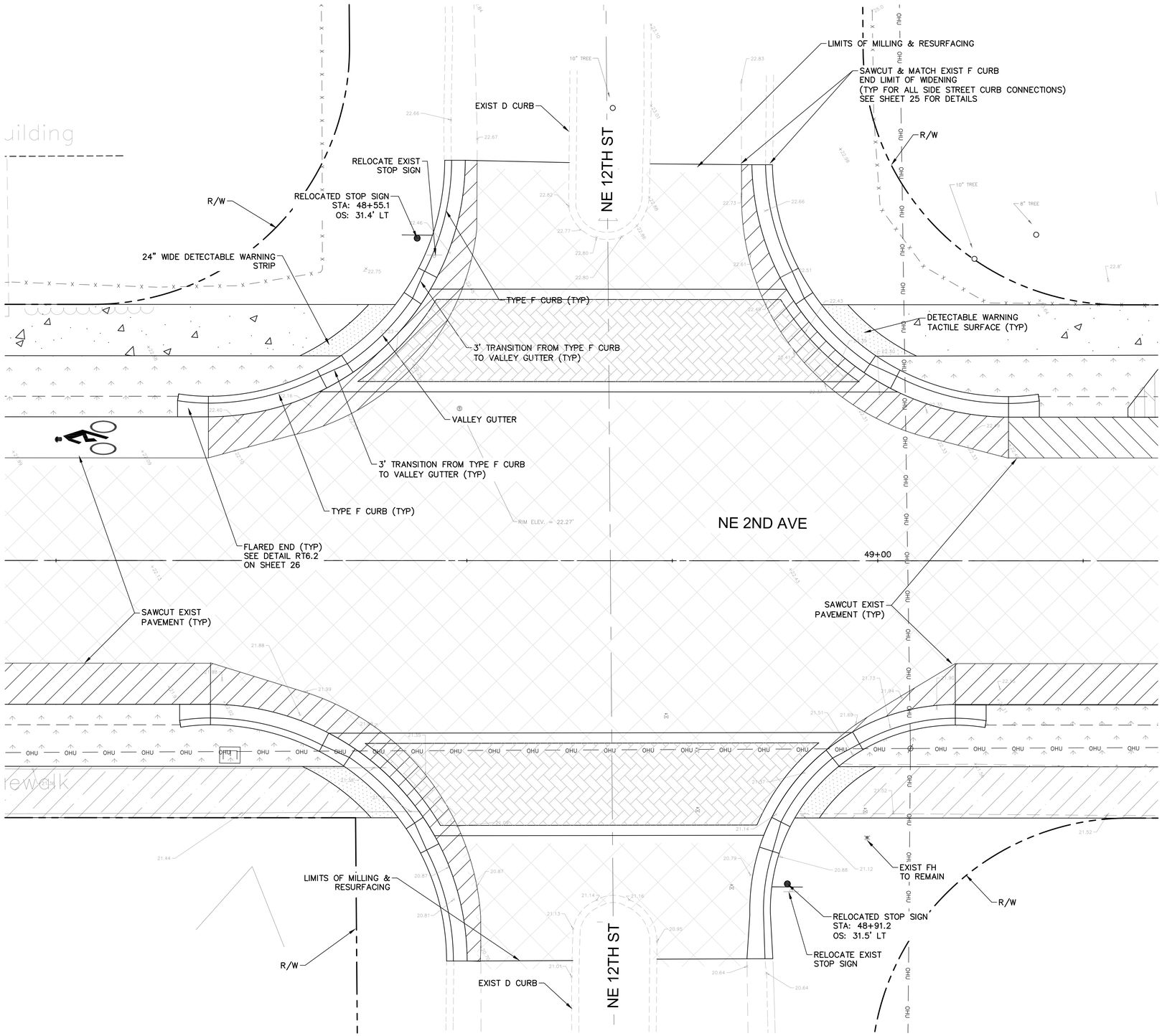
CAD NE2_RD PLANS.DWG		DRAWN	SCC
JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS	23	CHECKED	BNO
DATE	5/4/2017	QC	JWR
SCALE	1" = 5'		

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
INTERSECTION DETAILS
NE 11TH STREET

SHEET:
C-10



North

0 2.5 5 10

PROP. 4" THICK CONCRETE (REMOVE & REPLACE)		PROPOSED RECONSTRUCTED SHOULDER	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)		PROP. LIMITS OF MILL AND RESURFACE 1"	
PROP. 6" THICK CONCRETE (SIDEWALK)		PROP. SWALE REGRADING	
PROP. 6" THICK CONCRETE (DRIVEWAY)		PROP. PAVER BRICK CROSSWALK	

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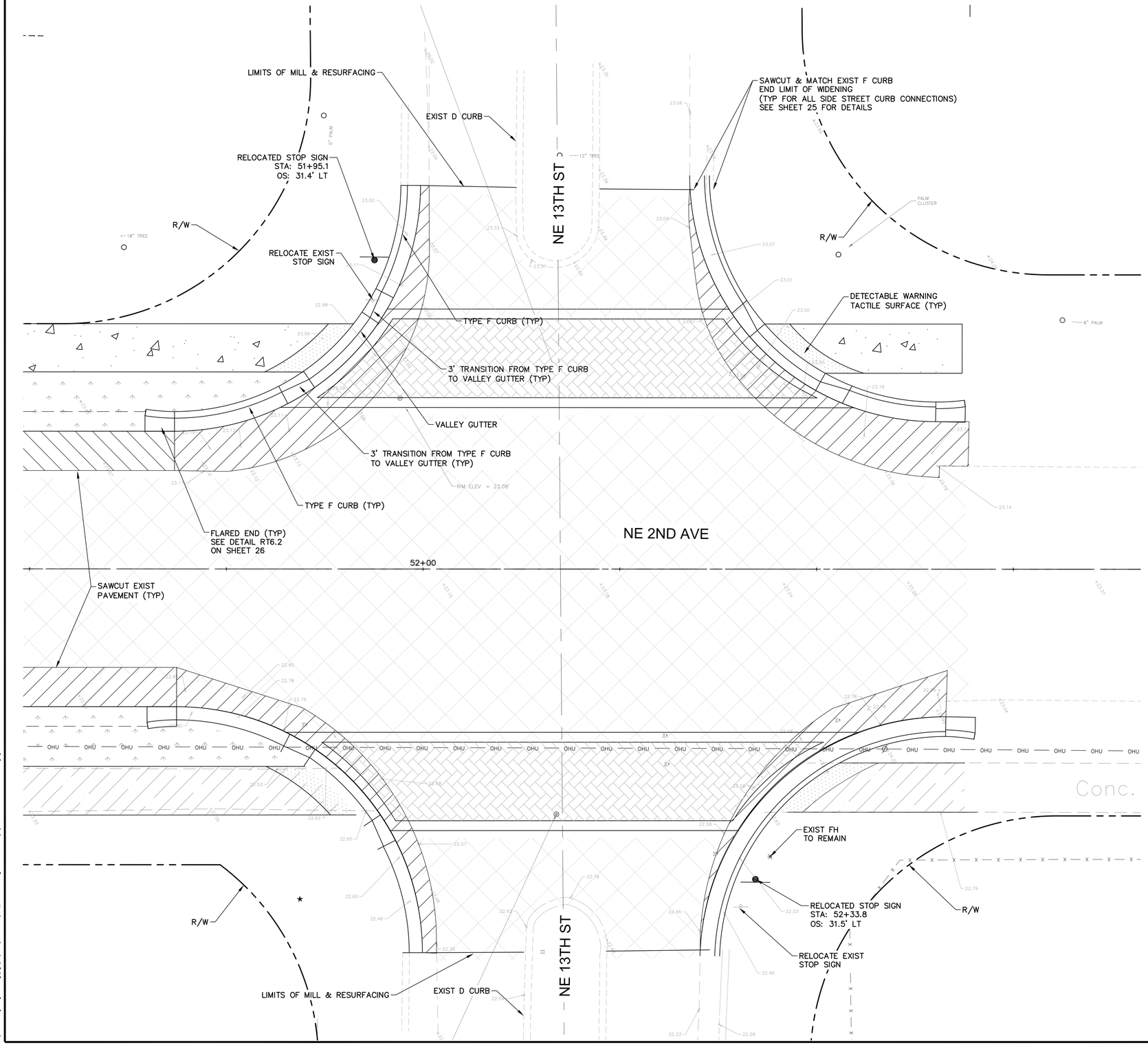
CAD NE2_RD PLANS.DWG		DRAWN	SCC
JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS	23	CHECKED	BNO
DATE	5/4/2017	QC	JWR
SCALE	1" = 5'		

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: INTERSECTION DETAILS NE 12TH STREET

SHEET: C-11



North

0 2.5 5 10

PROP. 4" THICK CONCRETE (REMOVE & REPLACE)		PROPOSED RECONSTRUCTED SHOULDER	
PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)		PROP. LIMITS OF MILL AND RESURFACE 1"	
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REVISIONS

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JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS	23	CHECKED	BNO
DATE	5/4/2017	QC	JWR
SCALE	1" = 5'		

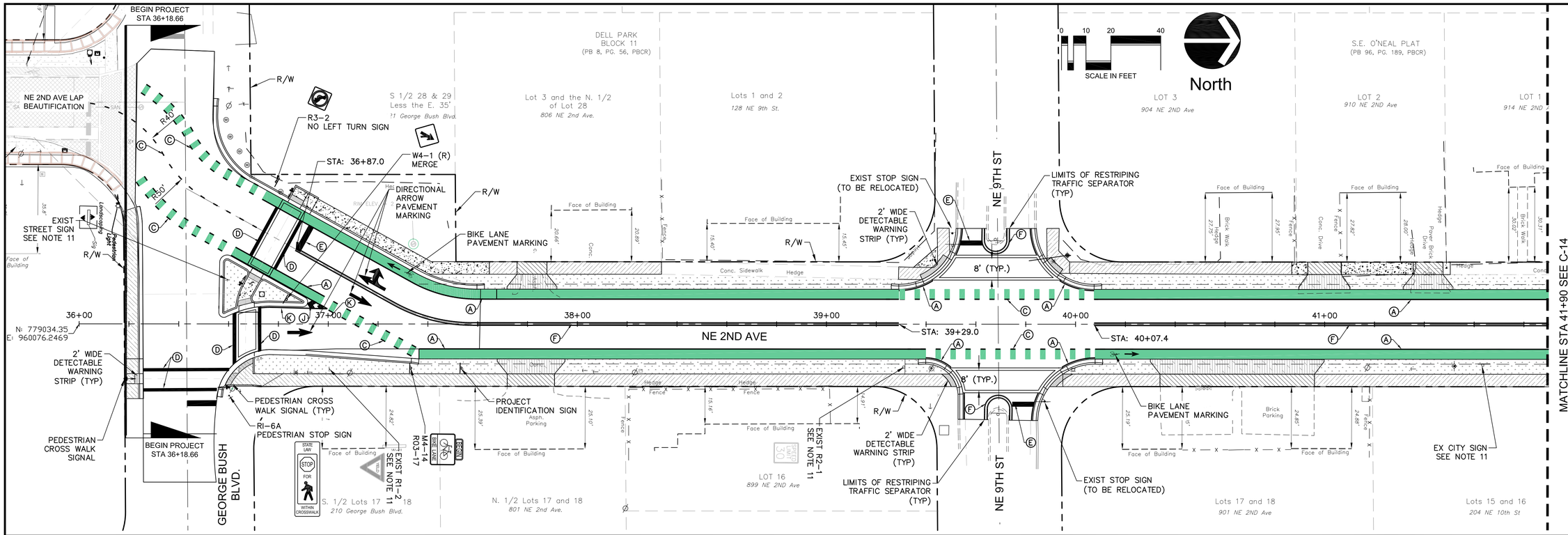
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: INTERSECTION DETAILS NE 13TH STREET

SHEET: C-12

Stephen Cherry G:\pwworking\wgi\sfeplan\proj36528\rwa2_RD PLANS.dwg use Plotted: 5/4/2017 10:00:02 AM Saved: 5/4/2017 8:34:38 AM



LEGEND

- STREET/STOP SIGN
- EXIST. BACKFLOW PREVENTER
- EXIST. BOLLARD
- EXIST. CLEANOUIT
- EXIST. FIRE HYDRANT
- EXIST. FLOOD LIGHT
- EXIST. GATE VALVE
- EXIST. SANITARY MANHOLE
- EXIST. METER WATER/ELECTRIC
- EXIST. POWER POLE
- PROP. 4" THICK CONCRETE (REMOVE & REPLACE)
- PROP. 4" THICK CONCRETE (NEW CONSTRUCTION)
- PROP. 6" THICK CONCRETE (SIDEWALK)
- PROP. 6" THICK CONCRETE (DRIVEWAY)
- PROP. GREEN BIKE LANE SURFACE
- PROP. SWALE REGRADING

PAVEMENT MARKING

- (A) 6" WHITE SOLID
- (C) 6" WHITE 2'-4' DOTTED
- (D) 12" WHITE
- (E) 24" WHITE
- (F) 6" DOUBLE YELLOW WITH RPMS
- (G) 6" SKIP WHITE 6'-10'
- (H) 6" DOUBLE YELLOW
- (J) 18" SOLID WHITE
- (K) 8" SOLID WHITE
- (L) FLEXIBLE DELINEATOR POST WHITE
- (M) RPM BI-DIRECTIONAL WHITE/RED

NOTE:
SEE DETAIL RT3.2 FOR TRAFFIC CONTROL STOP CONDITIONS AT INTERSECTIONS

NOTES:

1. ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITION.
2. ALL CROSSWALK SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346).
3. REFERENCE THE 2016 FDOT 600 SERIES FOR ALL REQUIRED AND APPLICABLE MOT PLANS.
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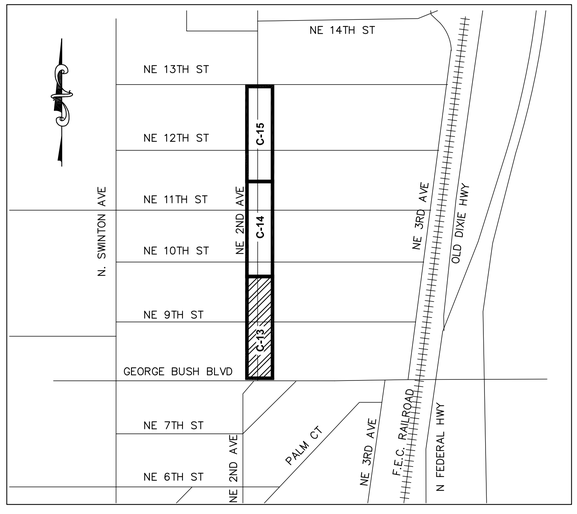

KEY MAP
SCALE : NONE

811 Know what's below. Call before you dig.

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ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

NO.	DATE	REVISIONS DESCRIPTION	BY

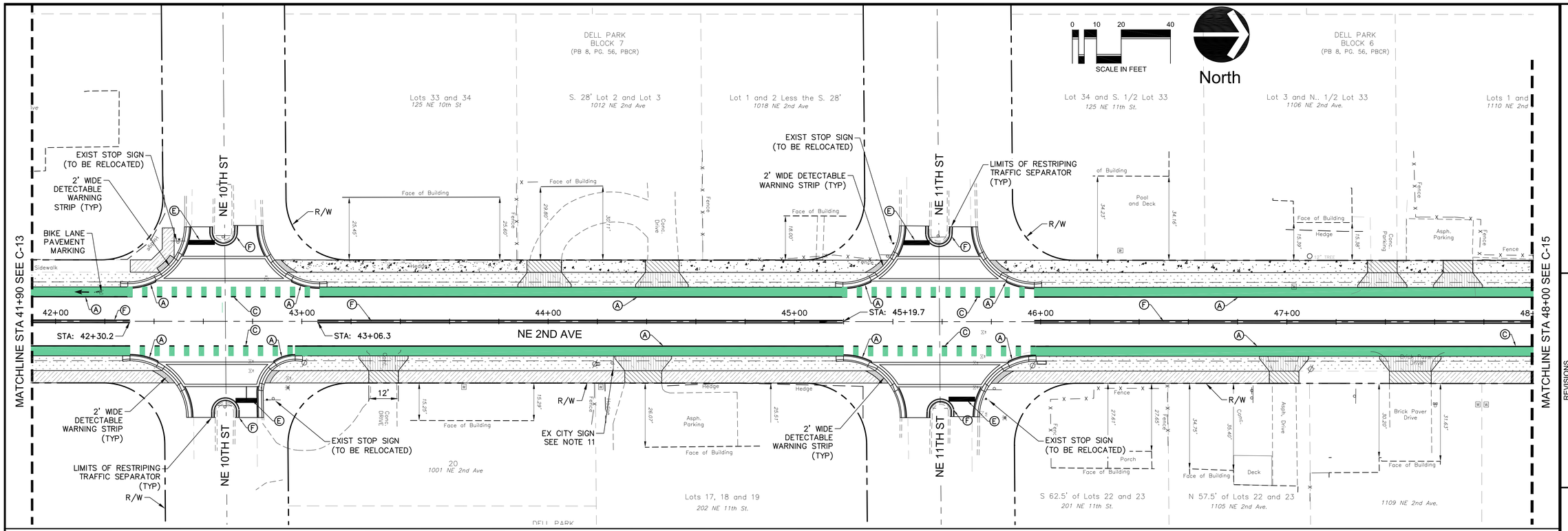
CAD NE2_SM PLANS.DWG			
JOB NO. 1004.11	DRAWN	SCC	
TOTAL SHEETS 23	DESIGNED	SCC	
DATE 5/4/2017	CHECKED	BNO	
SCALE 1" = 20'	QC	JWR	

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: SIGNING AND PAVEMENT MARKING PLAN

SHEET: C-13



LEGEND

- STREET/STOP SIGN
- EXIST. BACKFLOW PREVENTER
- EXIST. BOLLARD
- EXIST. CLEANOUIT
- EXIST. FIRE HYDRANT
- EXIST. FLOOD LIGHT
- EXIST. GATE VALVE
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NOTE:
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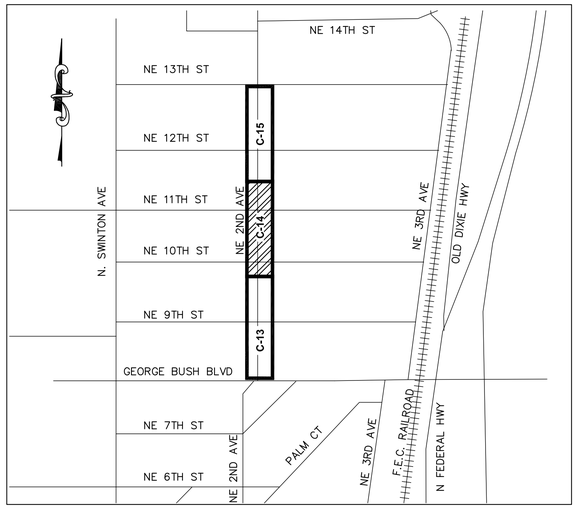

KEY MAP

SCALE : NONE

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CAD NE2_SM PLANS.DWG	
JOB NO. 1004.11	DRAWN SCC
TOTAL SHEETS 23	DESIGNED SCC
DATE 5/4/2017	CHECKED BNO
SCALE 1" = 20'	QC JWR

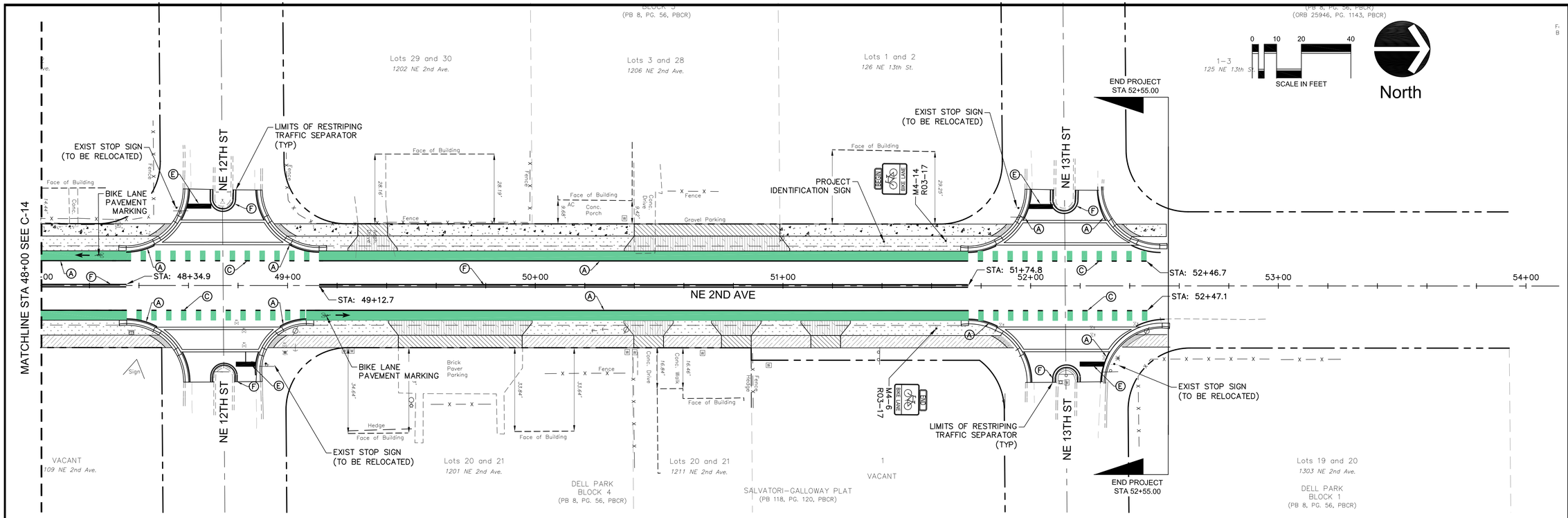
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: SIGNING AND PAVEMENT MARKING PLAN

SHEET: C-14

Stephen Cherry C:\pwworking\wgi\sflephen\dms36625\ne2_SM PLANS.dwg use Plotted: 5/4/2017 10:01:43 AM Saved: 5/4/2017 8:44:36 AM



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LEGEND

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- EXIST. BOLLARD
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- EXIST. FIRE HYDRANT
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- EXIST. GATE VALVE
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NOTE:
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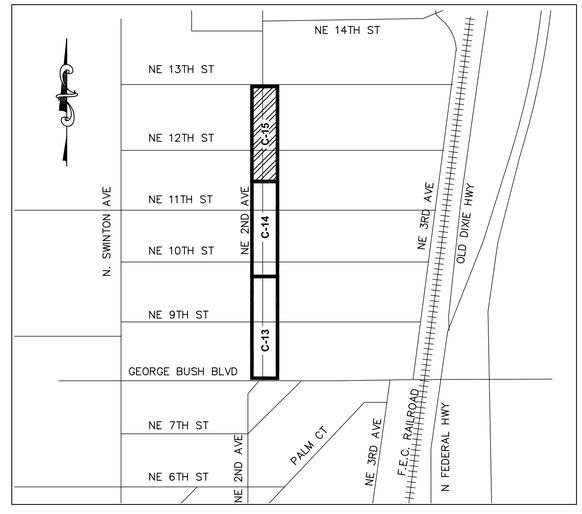

KEY MAP
SCALE : NONE

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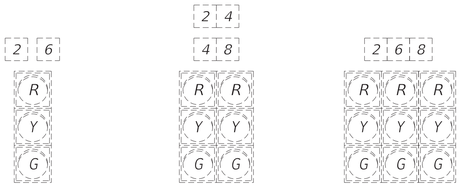
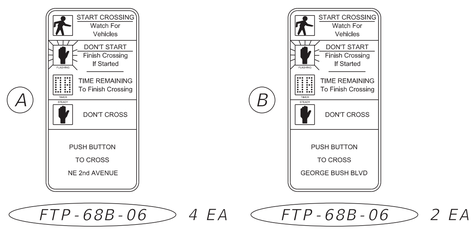
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: SIGNING AND PAVEMENT MARKING PLAN

SHEET: C-15





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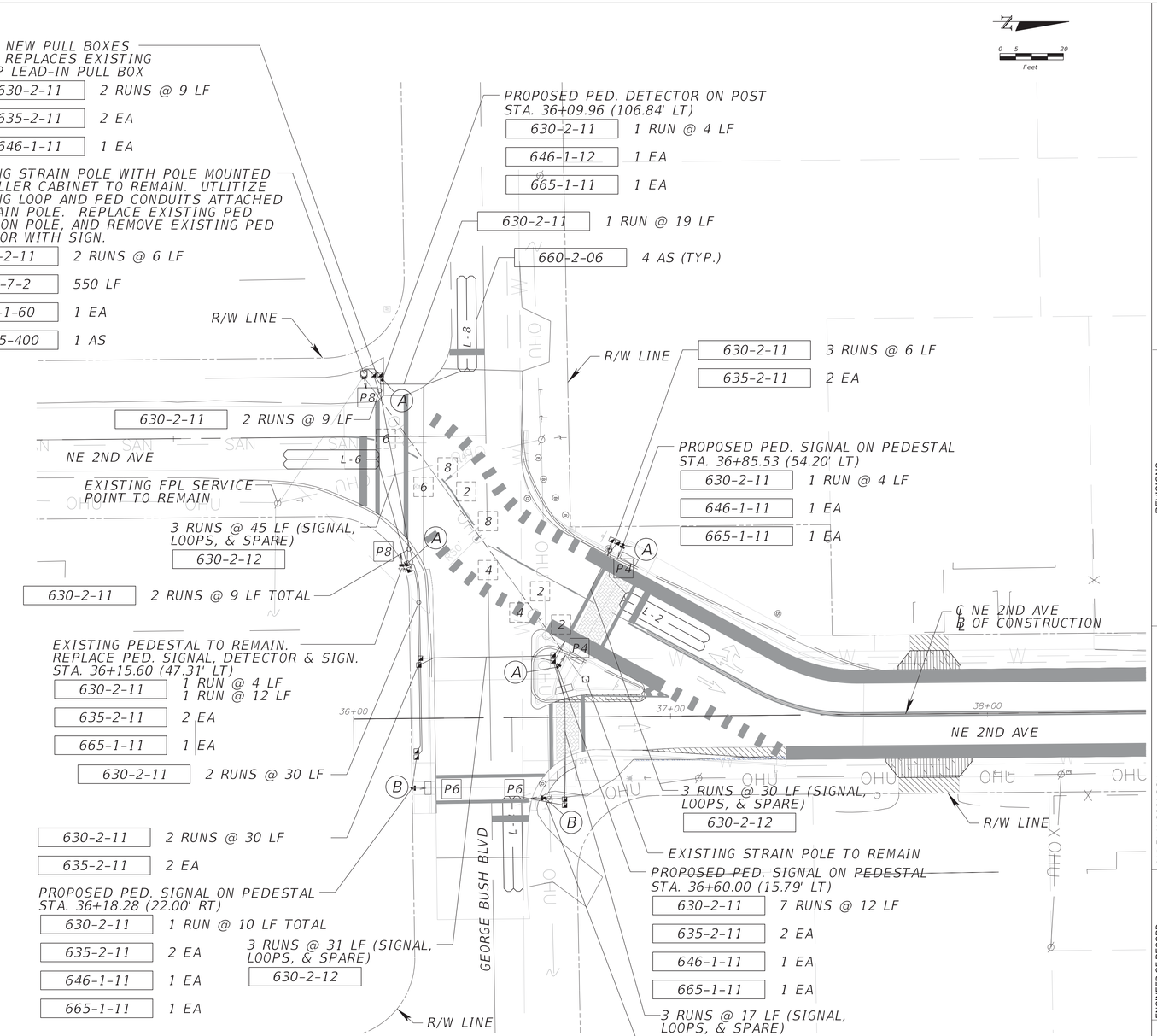
TO BE PAID UNDER PAY ITEMS 665-1-11



SIGNALIZATION PROJECT NOTES:

1. GOVERNING STANDARD FOR SIGNALIZATION DESIGN ARE AS FOLLOWS; FLORDIA DEPARTMENT OF TRANSPORTATION, 2016 DESIGN STANDARDS, 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND PALM BEACH COUNTY TRAFFIC SIGNAL INSTALLATION STANDARDS AND DETAILS DATED 2015.
2. THE AGENCY RESPONSIBLE FOR MAINTENANCE OF THE TRAFFIC SIGNALS AND RELATED ITS COMMUNICATIONS EQUIPMENT IS PALM BEACH COUNTY TRAFFIC ENGINEERING DIVISION (PBCTED). ALL TRAFFIC SIGNAL AND RELATED ITS COMMUNICATION EQUIPMENT WHEN USING PAY ITEM SERIES: 632, 633, 635, 650, 660, 670, 683, 684, 685 AND 686 FOR THIS CONTRACT SHALL BE COMPATIBLE WITH PBCTED'S CENTRAL COMPUTER NETWORK SYSTEM. PRIOR TO ANY PURCHASING OF THE ABOVE PRODUCTS, ENSURE THEY HAVE BEEN APPROVED FOR SYSTEM COMPATIBILITY BY THE MAINTAINING AGENCY.
3. THE CONTRACTOR SHALL MAKE ALL LOOP DETECTORS INSTALLED AS PART OF THE PROJECT FULLY OPERATIONAL IN ACCORDANCE WITH THEIR ASSOCIATED ISOLATED INTERSECTION SIGNAL TIMING CHART WITHIN 24 HOURS OF THEIR INSTALLATION.
4. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY TWO (2) FULL WORKING DAYS IN ADVANCE OF ANY EXCAVATION INVOLVING ITS UTILITIES SO THAT A COMPANY REPRESENTATIVE CAN BE PRESENT. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. SEE UTILITY OWNERS ON ROADWAY GENERAL NOTES.
5. THE CONTRACTOR SHALL PROVIDE FOUR COPIES OF MARKED-UP (AS-BUILT) CONSTRUCTION PLANS, AND ONE CAD FILE OF SUCH, AT THE TIME OF SIGNAL CONDITIONAL ACCEPTANCE INSPECTION BY THE MAINTAINING AGENCY.
6. ALL STANDARD SIGNAL PULL BOXES SHALL BE STAMPED "TRAFFIC SIGNAL". STANDARD SIGNAL PULL BOXES SHALL BE 17"x 30"x 12".
7. THE CONTRACTOR SHALL CONTACT THE PALM BEACH OPERATIONS SIGNALIZATION COORDINATOR FOR ALL SIGNALIZATION INSPECTIONS AT THE PALM BEACH OPERATIONS CENTER - (561) 432-4996.
8. ALL SPLICES OF LOOP WIRE TO LEAD-IN CABLE SHALL BE LOCATED IN PULL BOXES AND SOLDERED AND TAPED WITH A WATERPROOF COATING APPLIED IN A MANNER APPROVED BY THE ENGINEER.
9. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL CONTACT THE PBC TRAFFIC OPERATIONS SUPERINTENDENT, (561) 233-3900, TO INFORM THEM OF CONSTRUCTION OPERATIONS.

SIGNALIZATION PAY ITEM NOTES:

646-1-11: ALL PEDESTALS SHALL BE PROVIDED WITH TRANSFORMER BASES.

670-5-400: INCLUDES COST FOR MINOR CONNECTIONS OF LOOPS AND PEDESTRIAN SIGNALS.

GENERAL NOTES:

1. MAJOR STREET IS NE 2ND AVE
   MINOR STREET IS GEORGE BUSH BOULEVARD
2. MOVEMENT 2 AND 6 TO FLASH YELLOW AND ALL OTHERS TO FLASH RED DURING FLASHING OPERATION. PEDESTRIAN SIGNALS SHALL BE DARK.
3. FLORIDA DEPARTMENT OF TRANSPORTATION SIGNAL OPERATING PLAN (S.O.P.) 1 TO REMAIN.
4. FINAL SIGNAL TIMINGS TO BE PROVIDED BY PALM BEACH COUNTY TRAFFIC ENGINEERING DIVISION.
5. THE EXISTING POWER SERVICE POINT LOCATION IS TO REMAIN.
6. SPEED LIMITS:
   25 MPH - NE 2ND AVE SOUTH
   30 MPH - GEORGE BUSH BOULEVARD
   35 MPH - NE 2ND AVE NORTH
7. MAINTAIN EXISTING L.P.C.

PBC INTERSECTION 51600

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2035 Vista Parkway
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Fax No. 561.687.1110
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REVISIONS

NO.	DATE	DESCRIPTION	BY

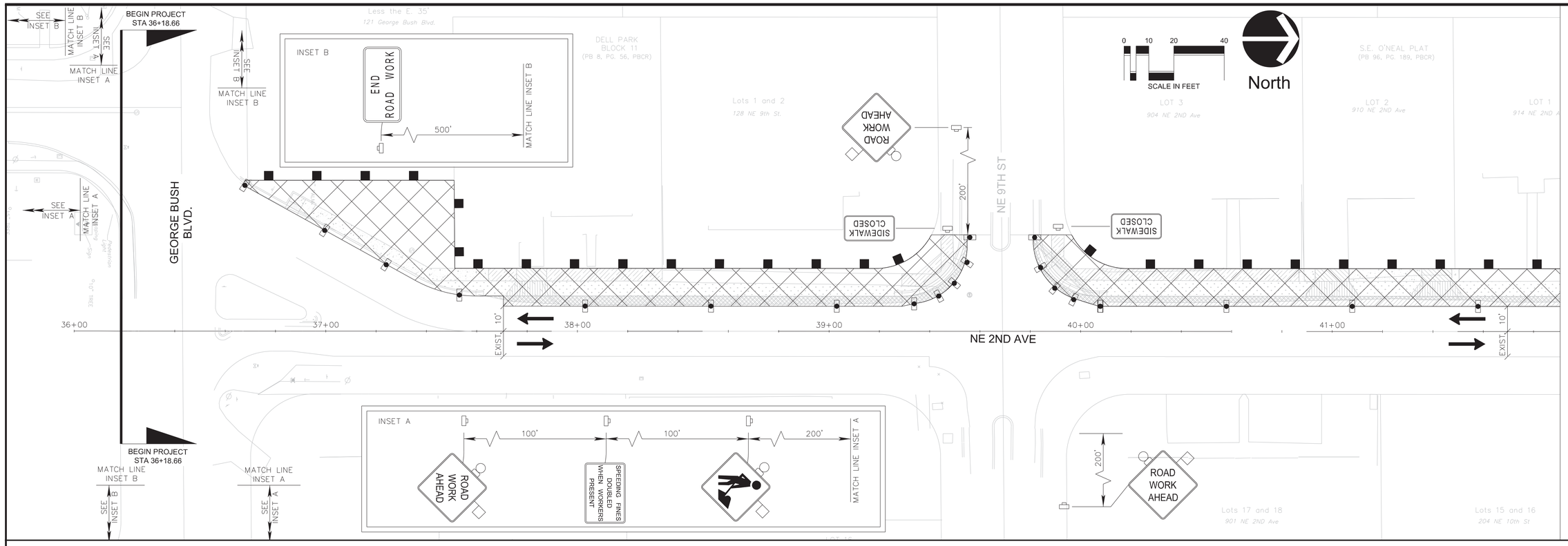
DRAWN	CMJ	CAD PLANSG01.DGN	
DESIGNED	CMJ	JOB NO. 1004.11	
CHECKED	KAL	TOTAL SHEETS 23	
QC	BAF	DATE 2/10/2016	
		SCALE 1" = 20'	

ENGINEER OF RECORD
KEEGAN LARSON, PE
PE# 69176

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: SIGNALIZATION PLANS

SHEET: C-16



NOTES:

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2. ALL CROSSWALK SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346).
3. SEE LANDSCAPE PLANS FOR REMOVAL/RELOCATION OF TREES, SHRUBS, AND ALL OTHER LANDSCAPING CONFLICTS.
4. REFERENCE AND CONFORM TO THE 2016 FDOT 600 SERIES FOR ALL REQUIRED AND APPLICABLE MOT PLANS.
5. SPACING OF CHANNELIZING DEVICES SHOWN IN TRAFFIC CONTROL PLAN SHALL CONFORM TO STANDARD INDEX 600 UNLESS OTHERWISE NOTED.
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7. CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
8. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3-12
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10. UTILIZE ROAD CLOSURES TO MINOR SIDESTREETS TO PROVIDE PROPER CONSTRUCTION OF PAVER BRICK CROSSWALKS INCLUDING CURE TIME. INSTALL TEMPORARY STEEL PLATING TO CROSSWALKS WITHIN NE 2ND AVE AND GEORGE BUSH BLVD. INTERSECTION TO PROVIDE FOR CURE TIME WHILE KEEPING THE TRAVEL LANES OPEN DURING THE DAY.

LEGEND

- LANE IDENTIFICATION AND DIRECTION OF TRAFFIC
- SIGN WITH 18" X 18" (MIN.) ORANGE FLAG AND TYPE B LIGHT
- TYPE I OR TYPE II BARRICADE OR VERTICAL PANEL OR DRUM (WITH STEADY BURNING LIGHT AT NIGHT ONLY)
- WORK ZONE SIGN
- WORK ZONE
- SEDIMENT BARRIER (SILT FENCE)

SIGN PANELS

SIDEWALK CLOSED — R9-9, 24" X 12"

END ROAD WORK — G-20-2, 36" X 18"

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT — MOT-14-06, 54" X 36"

ROAD WORK AHEAD — W20-1F, 48" X 48"

W21-1, 48" X 48"

TRAFFIC CONTROL PLAN PHASE NOTES:

PHASE I:
** WORK ON THE WEST SIDE OF NE 2ND AVENUE WHILE THE EAST SIDE REMAINS ACCESSIBLE TO PEDESTRIANS.

1. MAINTAIN TRAFFIC IN EXISTING CONFIGURATION.
2. INSTALL TRAFFIC CONTROL SIGNS AND DEVICES PER STANDARD INDEX 600, 603 AND 660 AS APPLICABLE.
3. BEGIN CLEARING AND GRUBBING WITHIN THE LIMITS OF THE WORK ZONE.
4. CONSTRUCT ALL PROPOSED IMPROVEMENTS WITHIN THE WORK ZONE AS SHOWN IN THE PLANS.

PHASE II:
** WORK ON THE EAST SIDE OF NE 2ND AVENUE WHILE PEDESTRIANS UTILIZE THE NEWLY CONSTRUCTED WEST SIDE.

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2. INSTALL TRAFFIC CONTROL SIGNS AND DEVICES PER STANDARD INDEX 600, 603 AND 660 AS APPLICABLE.
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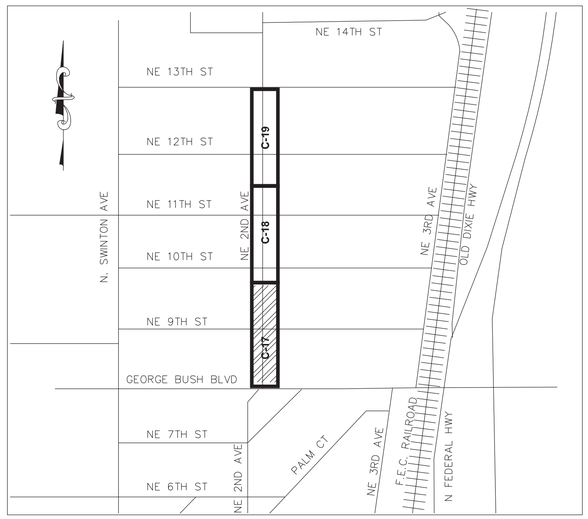

KEY MAP
SCALE : NONE

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REVISIONS			
NO.	DATE	DESCRIPTION	BY

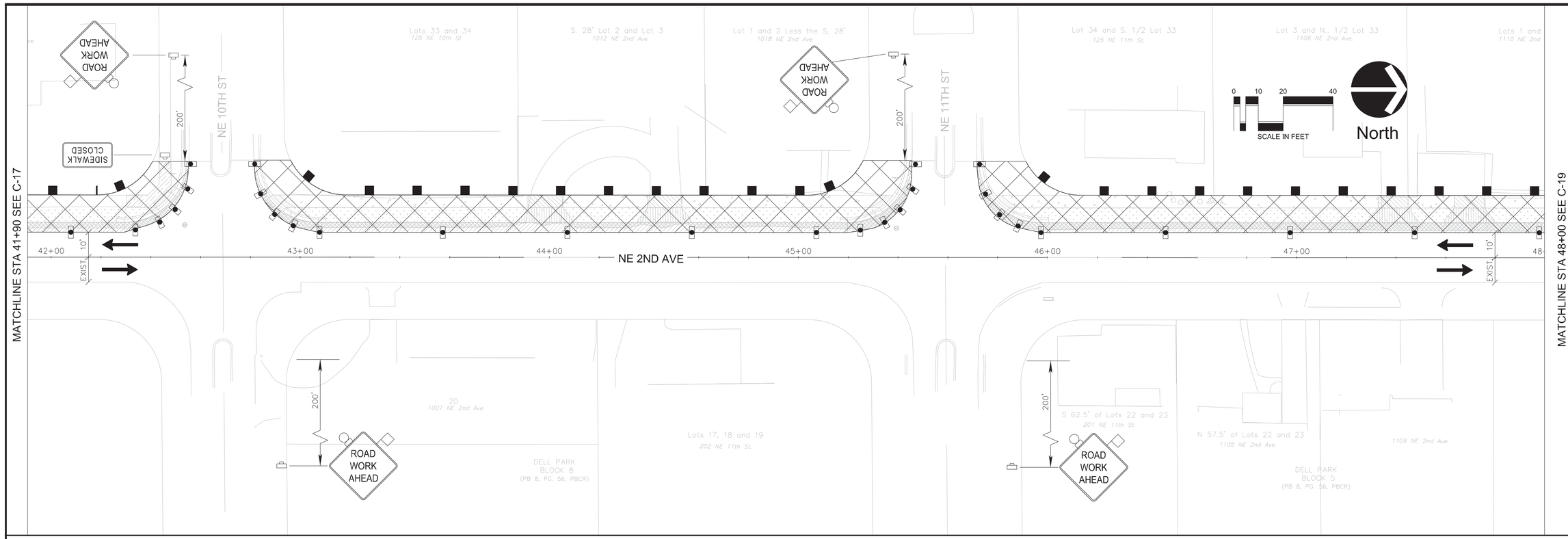
CAD MOT PLANS.DWG		DRAWN	CAH
JOB NO.	1004.11	DESIGNED	CAH
TOTAL SHEETS	28	CHECKED	BNO
DATE	08/26/15	QC	KAL
SCALE	1" = 20'		

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE I

SHEET: C-17



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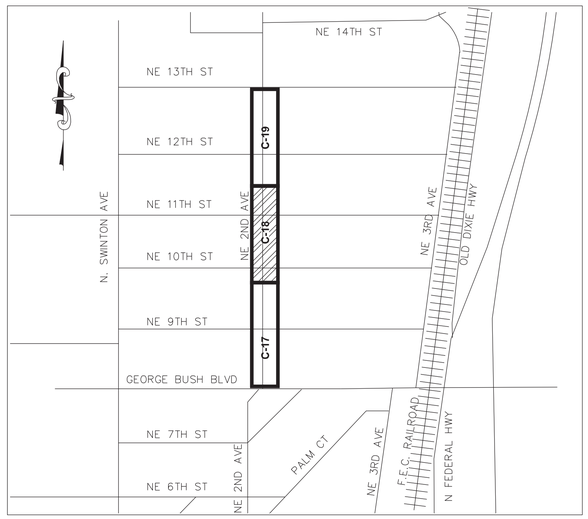

KEY MAP
SCALE : NONE

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REVISIONS			
NO.	DATE	DESCRIPTION	BY

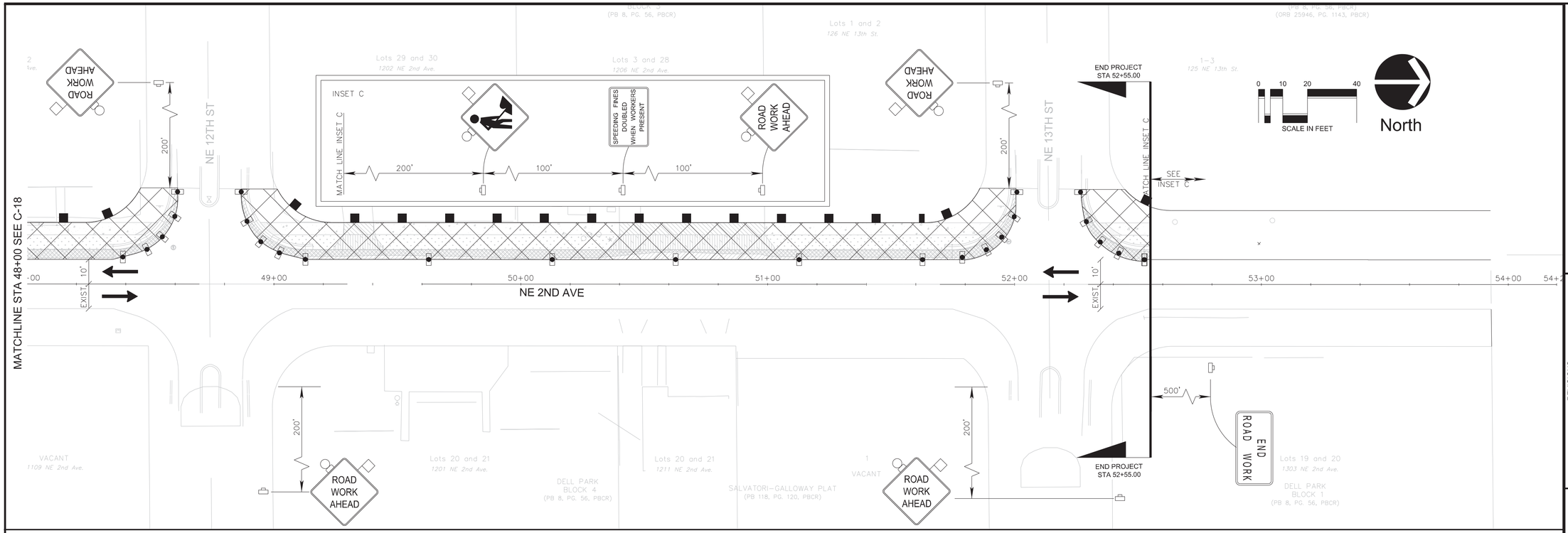
CAD MOT PLANS.DWG			
JOB NO. 1004.11	DRAWN	CAH	
TOTAL SHEETS 28	DESIGNED	CAH	
DATE 8/12/2015	CHECKED	BNO	
SCALE 1" = 20'	QC	KAL	

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE I

SHEET: C-18



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KEY MAP
SCALE : NONE

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REVISIONS

NO.	DATE	DESCRIPTION	BY

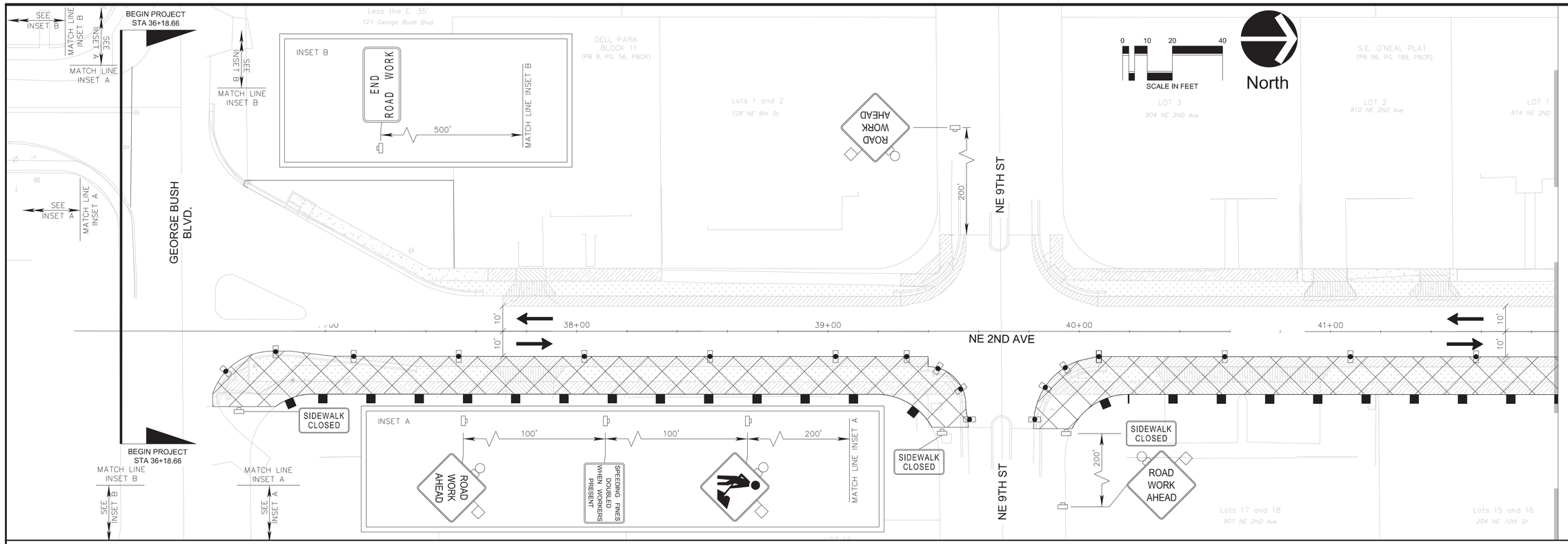
CAD MOT PLANS.DWG	DRAWN	CAH	
JOB NO. 1004.11	DESIGNED	CAH	
TOTAL SHEETS 28	CHECKED	BNO	
DATE 3/14/2017	QC	KAL	
SCALE 1" = 20'			

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE I

SHEET: C-19



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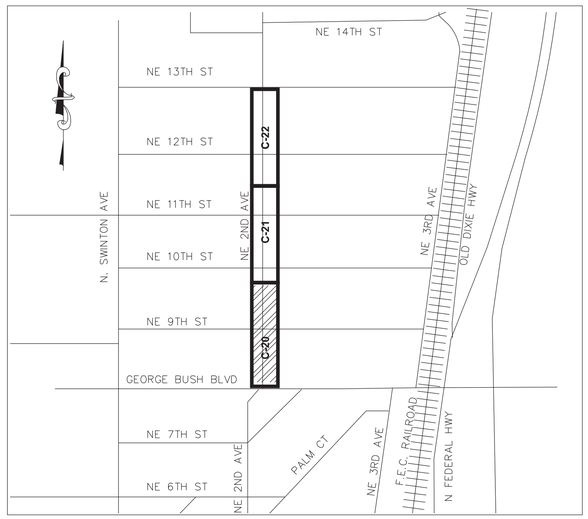

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BRETT OLDFORD, P.E.
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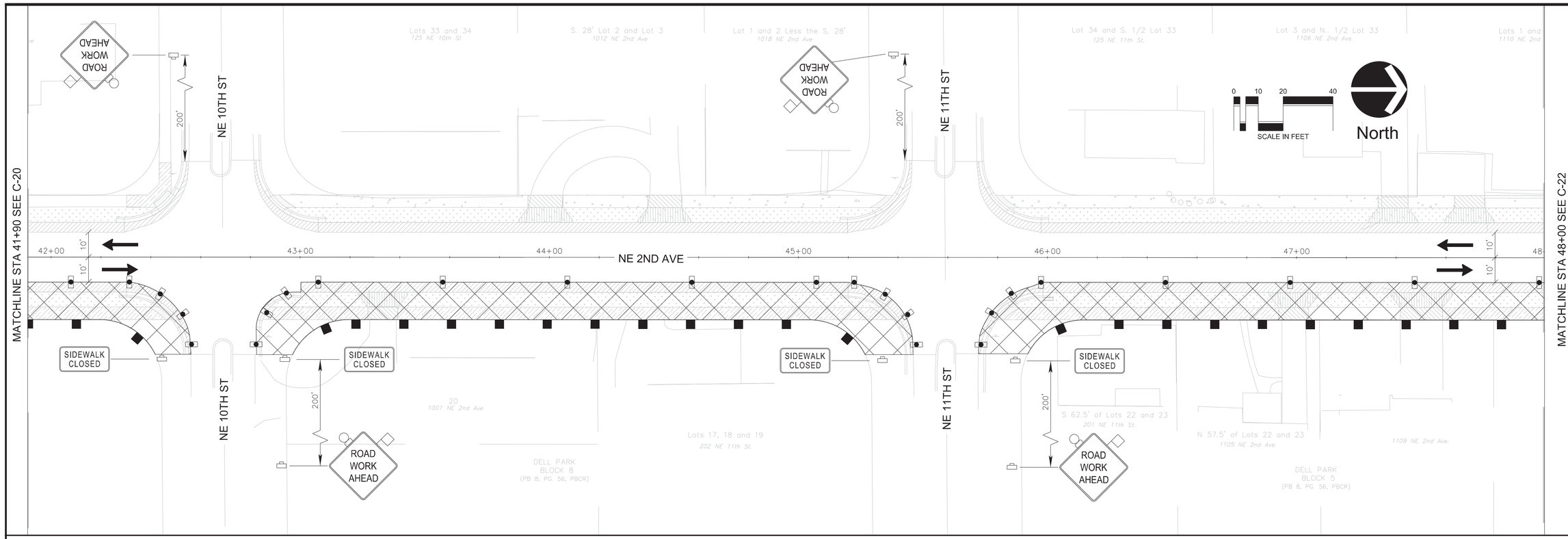
PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE II

SHEET: C-20



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PHASE I:
** WORK ON THE WEST SIDE OF NE 2ND AVENUE WHILE THE EAST SIDE REMAINS ACCESSIBLE TO PEDESTRIANS.

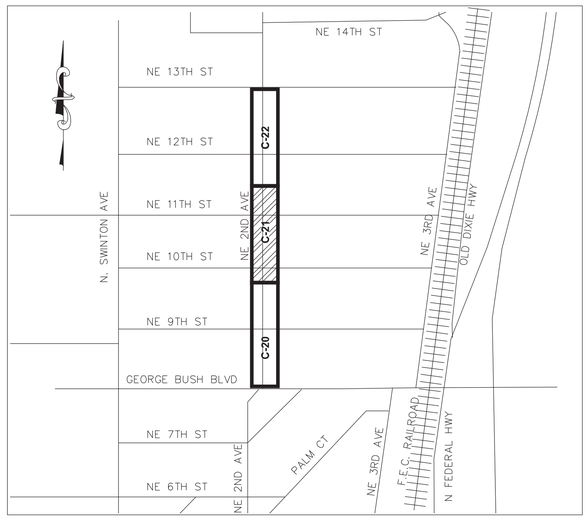
1. MAINTAIN TRAFFIC IN EXISTING CONFIGURATION.
2. INSTALL TRAFFIC CONTROL SIGNS AND DEVICES PER STANDARD INDEX 600, 603 AND 660 AS APPLICABLE.
3. BEGIN CLEARING AND GRUBBING WITHIN THE LIMITS OF THE WORK ZONE.
4. CONSTRUCT ALL PROPOSED IMPROVEMENTS WITHIN THE WORK ZONE AS SHOWN IN THE PLANS.

PHASE II:
** WORK ON THE EAST SIDE OF NE 2ND AVENUE WHILE PEDESTRIANS UTILIZE THE NEWLY CONSTRUCTED WEST SIDE.

1. MAINTAIN TRAFFIC IN EXISTING CONFIGURATION.
2. INSTALL TRAFFIC CONTROL SIGNS AND DEVICES PER STANDARD INDEX 600, 603 AND 660 AS APPLICABLE.
3. BEGIN CLEARING AND GRUBBING WITHIN THE LIMITS OF THE WORK ZONE.
4. CONSTRUCT ALL PROPOSED IMPROVEMENTS WITHIN THE WORK ZONE AS SHOWN IN THE PLANS.

PHASE III:
** MILLING & RESURFACING AND INTERSECTION WORK UPON COMPLETION OF PERIPHERAL CONSTRUCTION.

1. INSTALL TRAFFIC CONTROL SIGNS AND DEVICES PER STANDARD INDEX 600, 603 AND 660 AS APPLICABLE.
2. UTILIZE CLOSURES/DETOURS TO MILL & RESURFACE, COMPLETE WORK WITHIN INTERSECTIONS, CONSTRUCT PAVER BRICK CROSSWALKS AND PLACE PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PLANS. REFER TO STANDARD INDEX 603 FOR MOT INVOLVING WORK WITHIN THE TRAVEL WAY.
3. REFER TO INTERSECTION DETAILS FOR CONSTRUCTION OF PAVER BRICK CROSSWALKS WITHIN NE 2ND AVE. AND GEORGE BUSH BLVD. INTERSECTION. PARTIAL INTERSECTION CLOSURES TO OCCUR AT NIGHT, STEEL PLATING TO BE USED TO KEEP TRAVEL LANES OPEN DURING THE DAY.



KEY MAP
SCALE : NONE

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Cert No. 6091 - LB No. 7055
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REVISIONS			
NO.	DATE	DESCRIPTION	BY

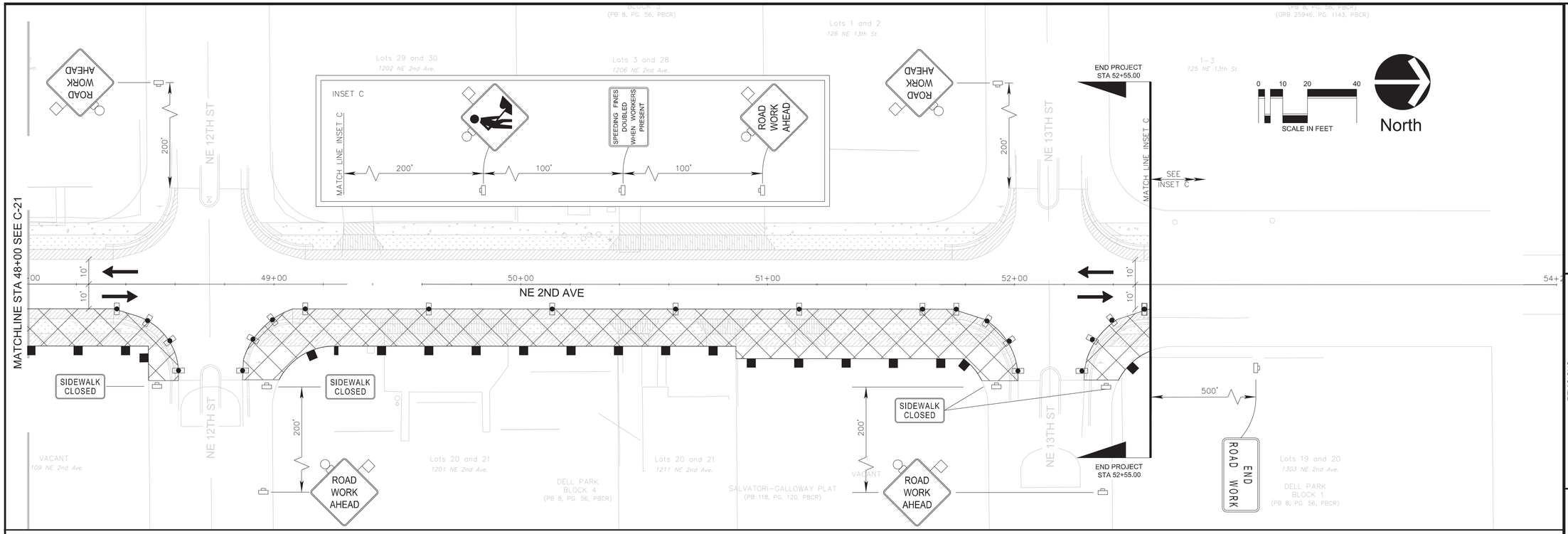
CAD MOT PLANS.DWG			
JOB NO. 1004.11	DRAWN	CAH	
TOTAL SHEETS 28	DESIGNED	CAH	
DATE 8/12/2015	CHECKED	BNO	
SCALE 1" = 20'	QC	KAL	

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE II

SHEET: C-21



NOTES:

1. ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITION.
2. ALL CROSSWALK SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346).
3. SEE LANDSCAPE PLANS FOR REMOVAL/RELOCATION OF TREES, SHRUBS, AND ALL OTHER LANDSCAPING CONFLICTS.
4. REFERENCE AND CONFORM TO THE 2016 FDOT 600 SERIES FOR ALL REQUIRED AND APPLICABLE MOT PLANS.
5. SPACING OF CHANNELIZING DEVICES SHOWN IN TRAFFIC CONTROL PLAN SHALL CONFORM TO STANDARD INDEX 600 UNLESS OTHERWISE NOTED.
6. ALL DETECTABLE BRICK PAVERS SHALL BE COLOR "BRICK RED".
7. CONTRACTOR SHALL BE RESPONSIBLE TO ADJUST VALVE RINGS AND COVERS TO MATCH PROPOSED GRADE.
8. REFER TO "MANUAL OF UNIFORM MINIMUM STANDARDS FOR DESIGN, CONSTRUCTION AND MAINTENANCE FOR STREETS AND HIGHWAYS" ALSO KNOWN AS THE "FLORIDA GREEN BOOK", FOR CLEAR ZONES. CHAPTER 3, TABLE 3-12
9. CONTRACTOR RESPONSIBLE TO REPLACE AND ITS TRAFFIC LOOPS.
10. UTILIZE ROAD CLOSURES TO MINOR SIDESTREETS TO PROVIDE PROPER CONSTRUCTION OF PAVER BRICK CROSSWALKS INCLUDING CURE TIME. INSTALL TEMPORARY STEEL PLATING TO CROSSWALKS WITHIN NE 2ND AVE AND GEORGE BUSH BLVD. INTERSECTION TO PROVIDE FOR CURE TIME WHILE KEEPING THE TRAVEL LANES OPEN DURING THE DAY.

LEGEND

- LANE IDENTIFICATION AND DIRECTION OF TRAFFIC
- SIGN WITH 18" X 18" (MIN.) ORANGE FLAG AND TYPE B LIGHT
- TYPE I OR TYPE II BARRICADE OR VERTICAL PANEL OR DRUM (WITH STEADY BURNING LIGHT AT NIGHT ONLY)
- WORK ZONE SIGN
- WORK ZONE
- SEDIMENT BARRIER (SILT FENCE)

SIGN PANELS

SIDEWALK CLOSED
R9-9
24" X 12"

END ROAD WORK
G-20-2
36" X 18"

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT
MOT-14-06
54" X 36"

ROAD WORK AHEAD
W20-1F
48" X 48"

W21-1
48" X 48"

TRAFFIC CONTROL PLAN PHASE NOTES:

PHASE I:
** WORK ON THE WEST SIDE OF NE 2ND AVENUE WHILE THE EAST SIDE REMAINS ACCESSIBLE TO PEDESTRIANS.

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** WORK ON THE EAST SIDE OF NE 2ND AVENUE WHILE PEDESTRIANS UTILIZE THE NEWLY CONSTRUCTED WEST SIDE.

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KEY MAP
SCALE : NONE

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REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD MOT PLANS.DWG	DRAWN	CAH	
JOB NO. 1004.11	DESIGNED	CAH	
TOTAL SHEETS 28	CHECKED	BNO	
DATE 3/14/2017	QC	KAL	
SCALE 1" = 20'			

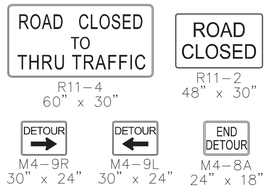
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN PHASE II

SHEET: C-22

SIGN PANELS



LEGEND

- DIRECTION OF TRAFFIC
- TYPE I, TYPE II, OR TYPE IIII BARRICADE (WITH WARNING LIGHT AT NIGHT ONLY)
- WORK ZONE SIGN
- WORK ZONE
- DETOUR ROUTE
- TYPE I OR TYPE II BARRICADE OR VERTICAL PANEL OR DRUM (WITH STEADY BURNING LIGHT AT NIGHT ONLY)

NOTES:

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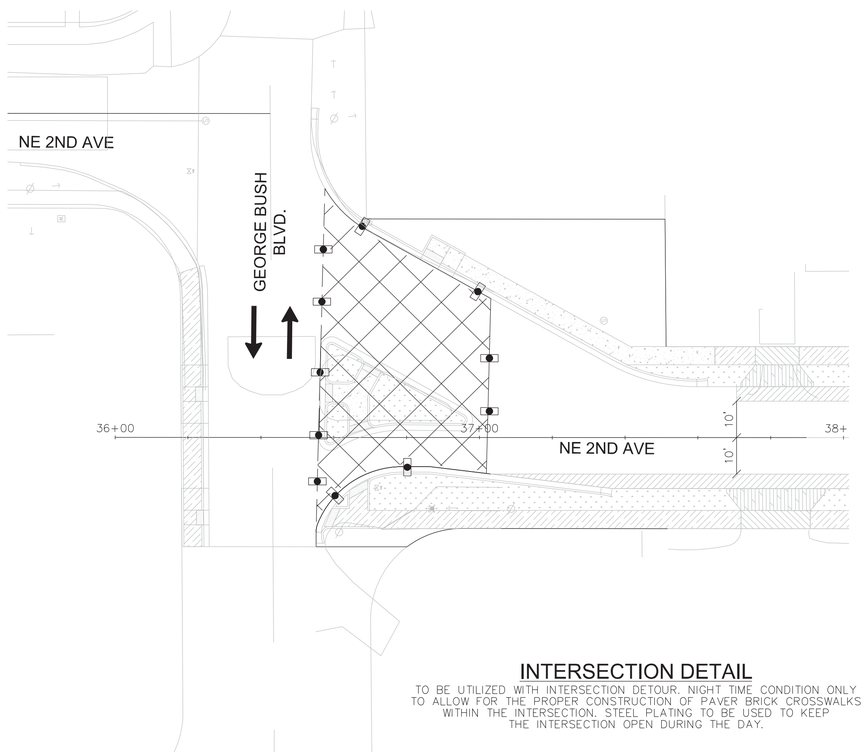
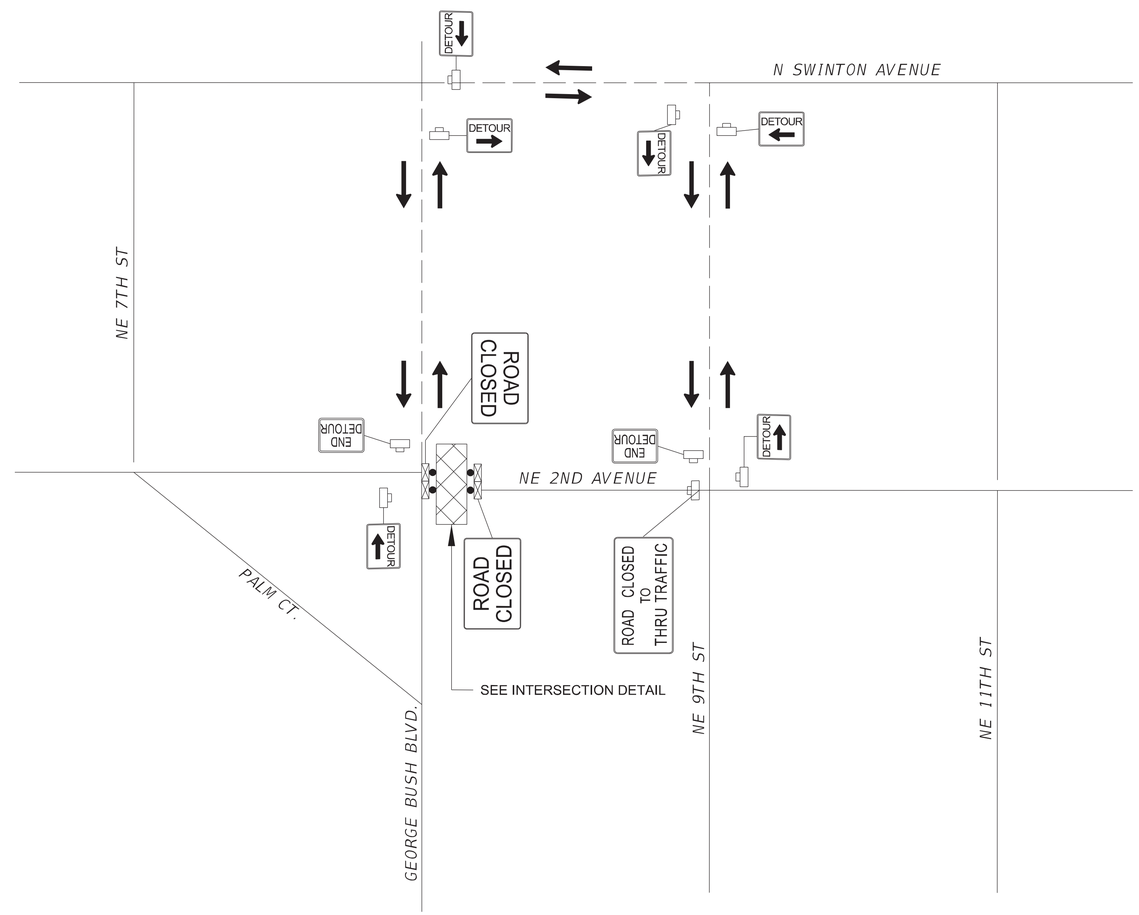


INTERSECTION DETAIL

TO BE UTILIZED WITH INTERSECTION DETOUR. NIGHT TIME CONDITION ONLY TO ALLOW FOR THE PROPER CONSTRUCTION OF PAVER BRICK CROSSWALKS WITHIN THE INTERSECTION. STEEL PLATING TO BE USED TO KEEP THE INTERSECTION OPEN DURING THE DAY.



NIGHT TIME DETOUR

UTILIZE NIGHT TIME DETOUR TO POUR 6" CONCRETE REQUIRED FOR BRICK PAVER CROSSWALKS WITHIN GEORGE BUSH BLVD./NE 2ND AVE. INTERSECTION. UTILIZE STEEL PLATING TO ALLOW THE TRAVEL LANES TO REMAIN OPEN DURING THE CURE TIME.

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SCALE 1" = 20'	QC	KAL	

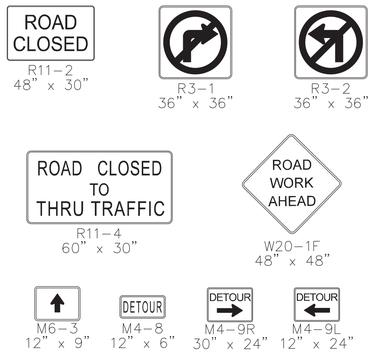
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN INTERSECTION DETAIL

SHEET: C-23

SIGN PANELS



LEGEND

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- TYPE I, TYPE II, OR TYPE IIII BARRICADE (WITH WARNING LIGHT AT NIGHT ONLY)
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- WORK ZONE
- DETOUR ROUTE

NOTES:

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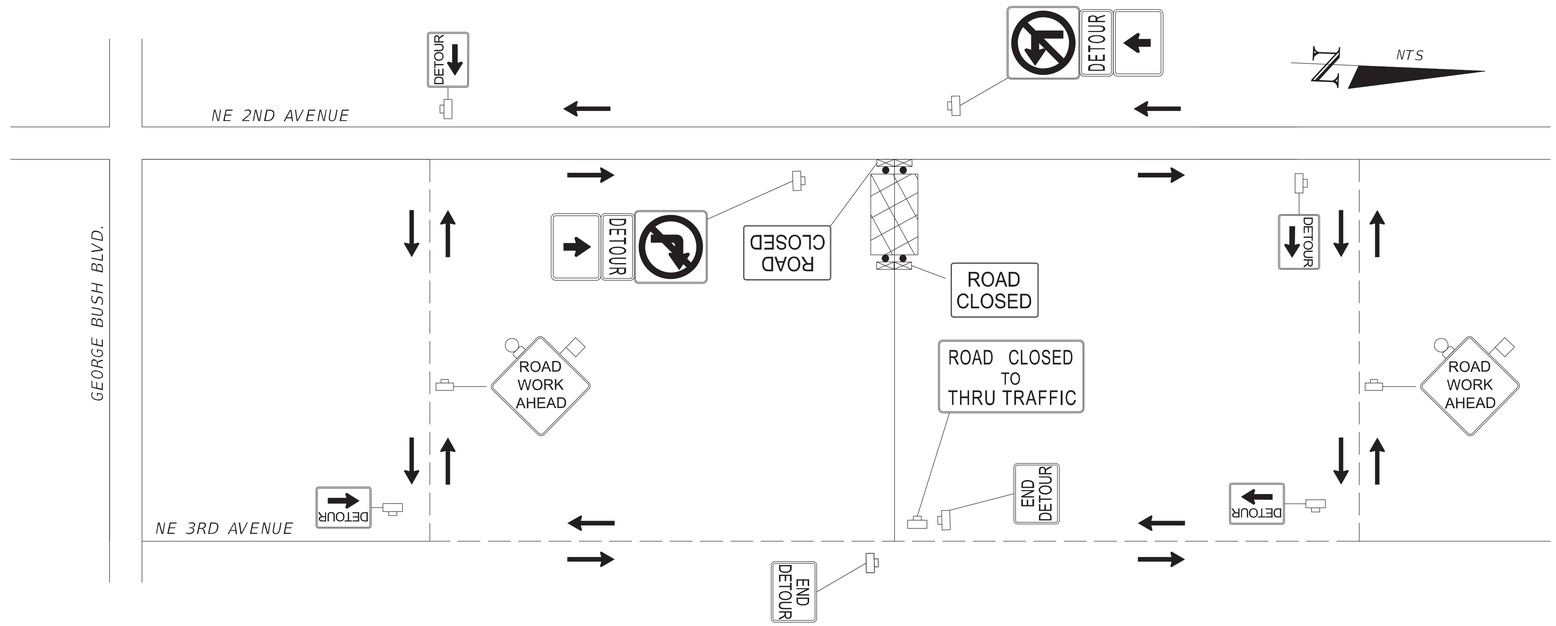
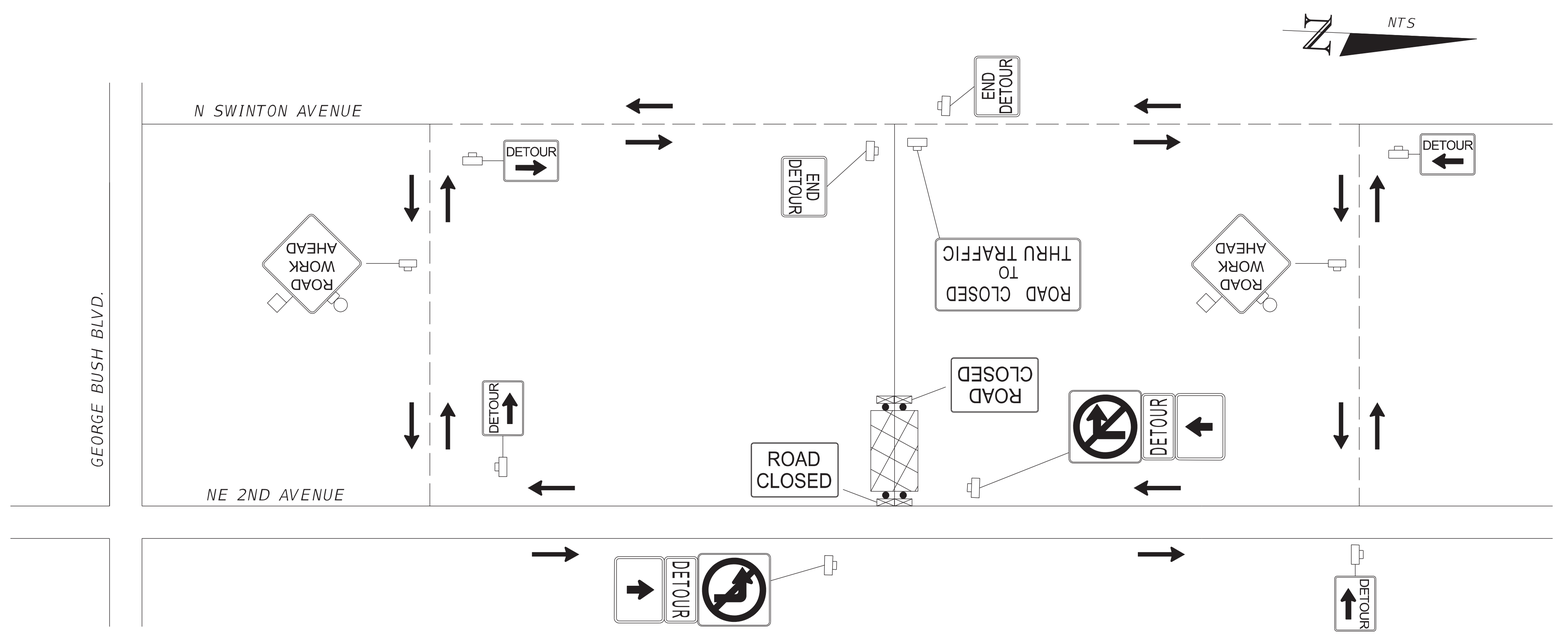


TYPICAL DETOUR FOR SIDESTREET CLOSURE ON THE EAST SIDE OF NE 2ND AVENUE

NOTE:

SIDESTREETS ADJACENT TO CLOSED SIDESTREET TO REMAIN OPEN



TYPICAL DETOUR FOR SIDESTREET CLOSURE ON THE WEST SIDE OF NE 2ND AVENUE

NOTE:

SIDESTREETS ADJACENT TO CLOSED SIDESTREET TO REMAIN OPEN

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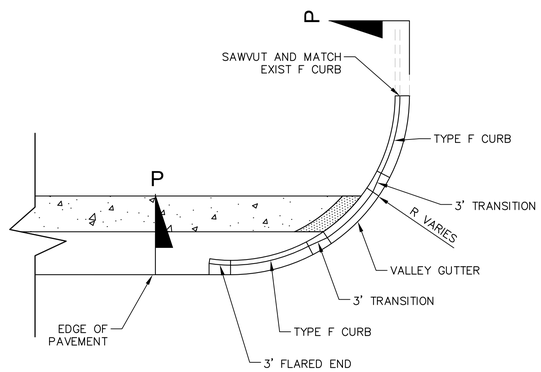
DATE 8/12/2015	CHECKED	BNO	
SCALE 1" = 20'	QC	KAL	

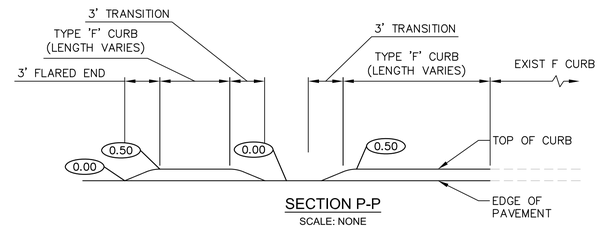
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVE SEACREST BEAUTIFICATION PHASE II

TASK: TRAFFIC CONTROL PLAN SIDESTREET CLOSURE DETAIL

SHEET: C-24

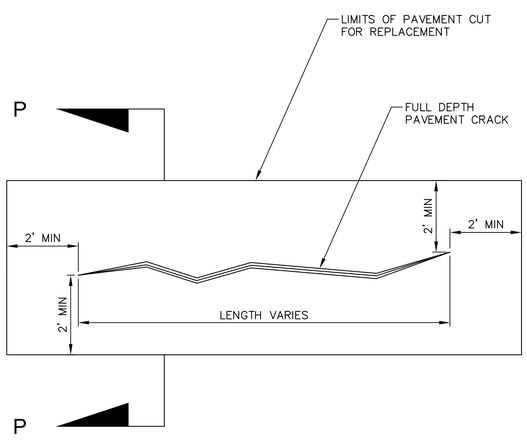




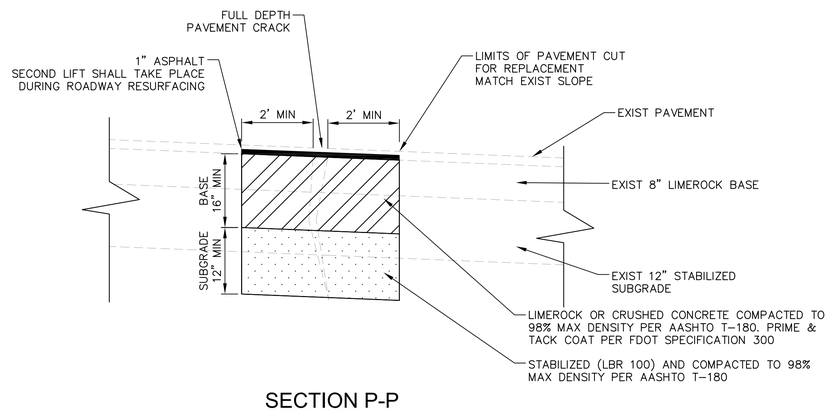
SECTION P-P
SCALE: NONE

TYPICAL INTERSECTION CURB PROFILE

SCALE: NONE



PLAN VIEW



SECTION P-P

FULL DEPTH PAVEMENT CRACK REPLACEMENT

SCALE: NONE

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NO.	DATE	DESCRIPTION	BY

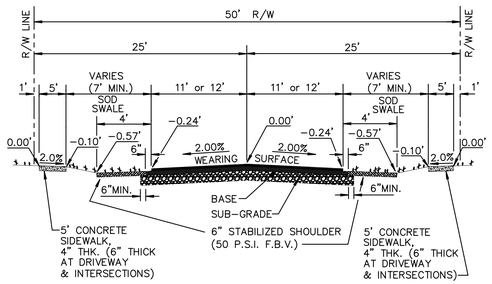
CAD NE2_TYP.DWG		DRAWN	SCC
JOB NO. 1004.11		DESIGNED	SCC
TOTAL SHEETS	28	CHECKED	BNO
DATE	8/18/2016	QC	JWR
SCALE	N/A		

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
DETAIL AND SPECIFICATIONS

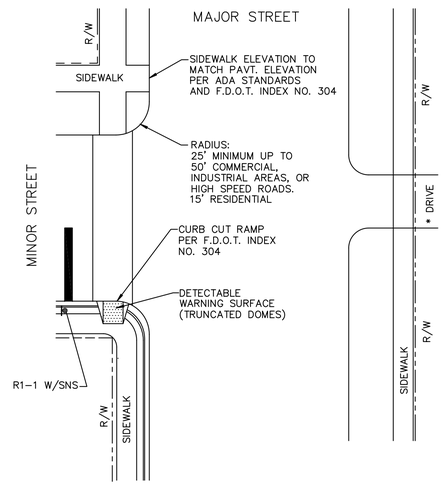
SHEET:
C-25



PAVEMENT SPECIFICATIONS	
WEARING SURFACE	1 1/2" TYPE SP-9.5 (2 LIFTS) SEE NOTE 2
BASE	8" LIMEROCK OR 10" CRUSHED CONCRETE COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180. PRIME & TACK COAT PER FDOT SPECIFICATION 300.
SUBGRADE	12" STABILIZED (LBR 40) AND COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180.

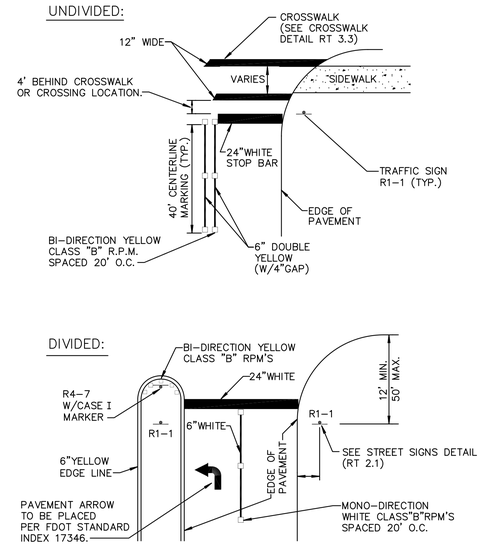
NOTE:
1. VARIATION FROM MATERIAL SPECIFICATIONS WILL BE CONSIDERED ON A CASE BY CASE BASIS BY THE CITY ENGINEER.
2. 2ND LIFT SHALL NOT TO BE PAVED UNTIL CONSTRUCTION VEHICLES AND EQUIPMENT HAVE COMPLETED WORK.
3. STABILIZE SHOULDER TO LBR 40.

TYPICAL 50' R/W SECTION WITH SWALE
DETAIL RT 1.1b



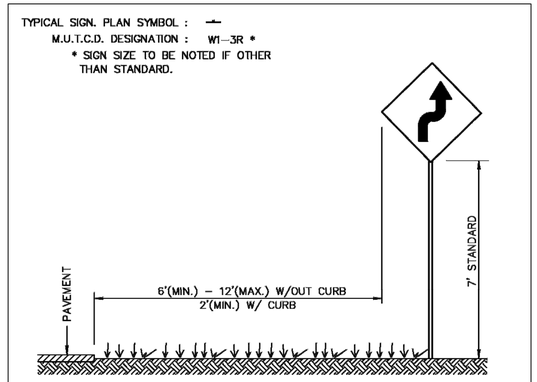
* DRIVEWAY DESIGN TO BE PER CITY LAND DEVELOPMENT REGULATIONS, FDOT STANDARD SPECIFICATIONS. ALL DESIGNS SUBJECT TO CITY ENGINEER APPROVAL.
* ALL WALKS CROSSING A VEHICULAR AREA SHALL HAVE A DETECTABLE WARNING SURFACE (TRUNCATED DOME) IN ACCORDANCE WITH THE FLORIDA BUILDING CODE, CHAPTER II, FL. ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION.

FLORIDA INTERSECTION DETAIL RT 3.1



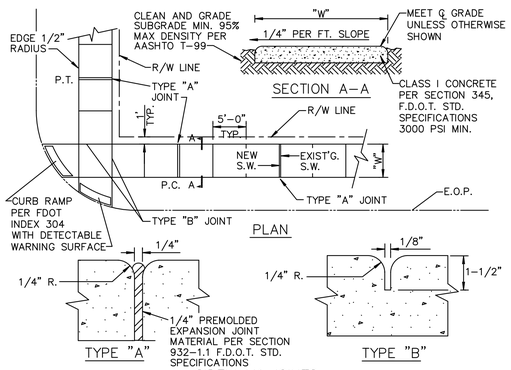
NOTE: ALL STRIPING AND DELINEATION TO CONFORM TO THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST ED.

INTERSECTION TRAFFIC CONTROL STOP CONDITION
DETAIL RT 3.2



NOTES:
1. ALL SIGNS SHALL BE SPECIFIED USING THE M.U.T.C.D. DESIGNATION.
2. ALL SIGNS SHALL BE FACED WITH HIGH INTENSITY SHEETING MATERIAL OR BETTER.
3. SIGNS SHALL BE MANUFACTURED WITH 0.080" ALUMINUM BLANK.
4. POSTS SHALL BE GALVANIZED CHANNEL AT 2 LBS/L.F.
5. USE SHALL FOLLOW THE M.U.T.C.D. AND F.D.O.T. STANDARD DESIGN SPECIFICATIONS
6. ANY DEVIATION FROM THIS TYPICAL SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
7. REFLECTIVE POSTS MAY BE USED IF M.U.T.C.D. STANDARD IS FOLLOWED.

STREET SIGN DETAIL
DETAIL RT 2.1b

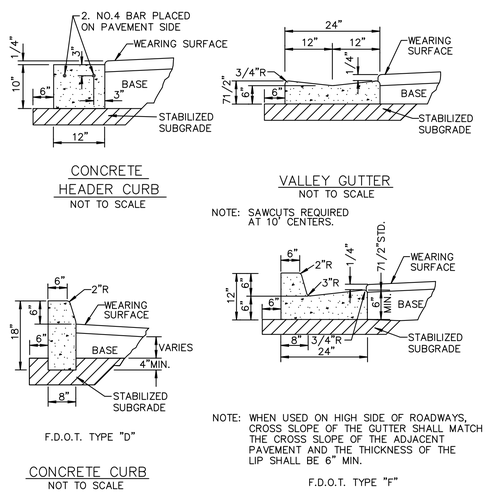


NOTE:
1. ALL SIDEWALKS SHALL BE CONSTRUCTED THRU DRIVEWAYS.
2. ALL SIDEWALKS SHALL INCLUDE ADA COMPLIANT RAMPS @ INTERSECTIONS.
2. ALL SIDEWALKS SHALL INCLUDE CROSS SLOPE AND RUNNING SLOPE IN ACCORDANCE WITH ADA REQUIREMENTS.
4. CURB RAMP DETECTALE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE RAMP AND 24" DEEP

TABLE OF SIDEWALK THICKNESS - "T"	
RESIDENTIAL AREAS	4"
WITHIN 10' OF CROSS-STREETS, AT DRIVEWAYS & OTHER AREAS	6"
TABLE OF SIDEWALK WIDTHS - "W"	
SINGLE-FAMILY AREAS	5'
MULTI-FAMILY AREAS	5'
OTHER AREAS AS SPECIFIED BY THE CITY ENGINEER.	

TABLE OF SIDEWALK JOINTS	
TYPE	LOCATION
"A"	P.C. AND P.T. OF CURVES JUNCTION OF EXISTING & NEW SIDEWALKS & EVERY 30'
"B"	5'-0" CENTER TO CENTER ON SIDEWALKS SCORED DURING PLACEMENT OR SAWCUT WITHIN 24 HOURS OF PLACEMENT.
"A"	WHERE SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS, AND SIMILAR STRUCTURES.

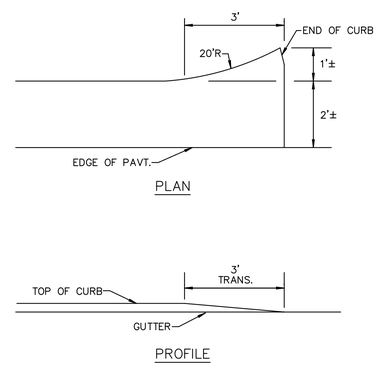
SIDEWALK CONSTRUCTION RT 5.1



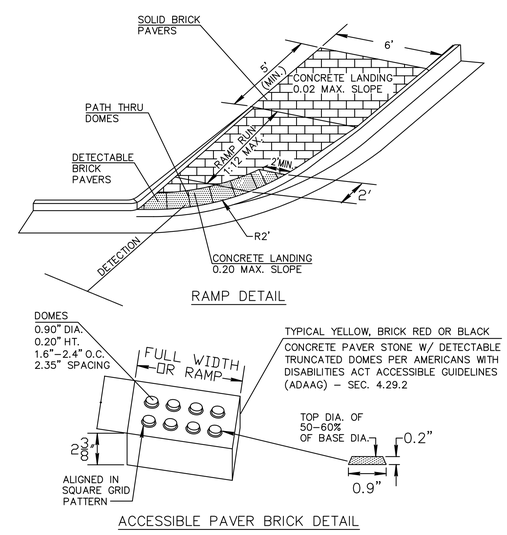
NOTE: WHEN USED ON HIGH SIDE OF ROADWAYS, CROSS SLOPE OF THE GUTTER SHALL MATCH THE CROSS SLOPE OF THE ADJACENT PAVEMENT AND THE THICKNESS OF THE LIP SHALL BE 6" MIN.

NOTES:
1. ROADWAY SUBGRADE SHALL IN ALL CASES EXTEND BELOW CURBING.
2. SAWCUTS AT 10' CENTERS SHALL BE MADE WITHIN 24 HOURS OF CONCRETE PLACEMENT.

CURB AND GUTTER SECTIONS RT 6.1



FLARED END FOR CURB AND GUTTER DETAIL RT 6.2



1. IN ADDITION TO CURB RAMPS TRUNCATED DOMES ARE REQUIRED AT ALL AREAS OF PERIL.

DETECTABLE WARNING RAMP
IN PAVER SIDEWALK TYPICAL DETAIL RT 10.3

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Cert No. 6091 - LB No. 7055
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REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD NE2_CITY DET.DWG	DRAWN	SCC	
JOB NO. 1004.11	DESIGNED	SCC	
TOTAL SHEETS 23	CHECKED	BNO	
DATE 7/27/15	QC	JWR	
SCALE N/A			

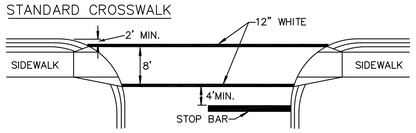
ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: DETAILS AND SPECIFICATIONS

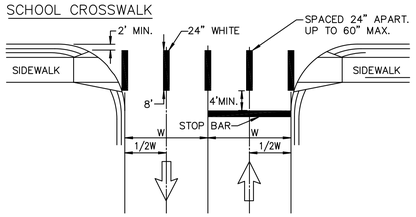
SHEET: C-26

STANDARD CROSSWALK



- STANDARD CROSSWALK STRIPING TO BE INSTALLED IN THE FOLLOWING LOCATIONS:
  - ALONG COLLECTORS OR ARTERIALS
  - BIKE PATH CROSSINGS
  - CROSS WALKS WITH HIGH EXPECTED PEDESTRIAN VOLUME
  - SCHOOL ACCESS ROUTES
- SIGNING REQUIRED AS PER FDOT STANDARD INDEX NO. 17346

SCHOOL CROSSWALK



- SCHOOL CROSSWALK STRIPING TO BE USED ONLY AT DESIGNATED SUPERVISED SCHOOL CROSSING
- SIGNS AND ADVANCED PAVEMENT MESSAGES TO BE DESIGNED AND INSTALLED PER FDOT STANDARD (INDEX NO. 17346)
- CROSSWALKS LOCATED MIDBLOCK MIN. WIDTH 10'ALL CROSSWALK MARKINGS SHALL BE WHITE.
- LONGITUDINAL LINES IN SPECIAL EMPHASIS CROSSWALK SHALL BE 24" WIDE AND SPACED TO AVOID THE WHEEL PATH OF VEHICLES AS SHOWN IN DETAIL. THE SPACE BETWEEN MARKINGS SHALL NOT EXCEED 60'. A LONGITUDINAL MARKING SHALL BE CENTERED AT EACH LANE LINE. ADDITIONAL LONGITUDINAL MAKINGS SHALL BE PLACED AT THE CENTER OF EACH LINE.
- WHERE THE CROSSWALK IS SKEWED TO THE LANE LANE LINES, THE SPECIAL EMPHASIS LONGITUDAL LINES SHOULD BE PARALLEL TO THE LANE LINE.

CROSSWALK DETAILS RT 3.3

PAVEMENT MARKING SPECIFICATIONS

All Pavement markings to be installed per these typicals, plans and specifications, and as directed by the City Engineer and shall conform to the requirements of F.D.O.T. and the manual on uniform traffic control devices, (MUTCD).

PERMANENT MARKINGS

Installation:
- All markings shall be installed by the extruded method.
- Markings shall be free of weaves, bows, drips, drags, and other degrading items.
- Chalk shall be used for all layout markings

Materials:
- All materials shall be alkyd or hydrocarbon thermoplastic meeting all FDOT specifications.

Thickness:
- All markings shall be installed to yield 90 mils of material measured above the pavement surface.

Spheres:
- Reflective glass sheres are to be applied to all stripes and markings per FDOT specifications.

Layout:
- Layout shall be made using marking chalk.
- It is recommended that marking layout be inspected by the City Engineer prior to the placement of final markings.

TEMPORARY MARKINGS

Temporary markings may be used only as specified in this section, or as approved or directed by the City Engineer.

Final Pavement Surface:
- Only foil backed marking tape is allowed.
- All tape shall be totally removed concurrent with permanent marking placement.

Other Pavement Surfaces:
- Intermediate pavement surfaces may be marked with FDOT approved materials, designs, and specifications.

PAVEMENT MARKING SPECIFICATIONS RT 8.1a
(Sheet 1 of 2)

ALL PAVEMENT MARKINGS

All paved surfaces shall be properly marked prior to the hours of darkness.

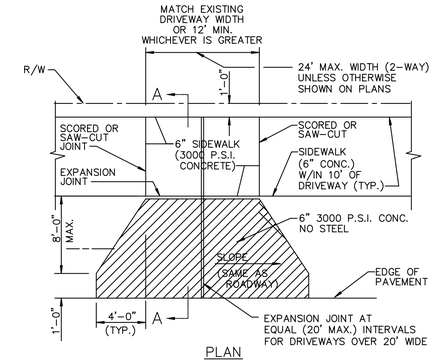
RAISED PAVEMENT MARKERS

- R.P.M.s shall be installed on all lane lines and centerlines, spaced at 20' or 40'.
- R.P.M.s shall be a 4 x 4 type class "B" marker meeting F.D.O.T. specifications and shall be approved by the City Engineer prior to use.
- R.P.M.'s shall be installed using alkyd thermoplastic on asphalt and epoxy on concrete.

OTHER NOTES

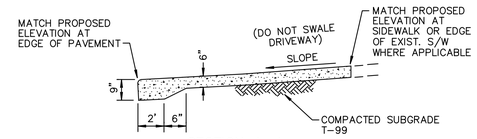
- All Materials within right-of-way shall be thermoplastic and per F.D.O.T. specifications.
- Pavement marking within private parking lots may be painted according to F.D.O.T. specifications, except for all stop bars adjacent to public rifgt-of-way.

PAVEMENT MARKING SPECIFICATIONS RT 8.1b
(Sheet 2 of 2)



PLAN

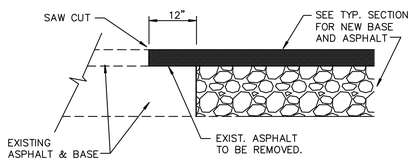
NOTE: SIDEWALK SHALL BE CONSTRUCTED THROUGH DRIVEWAY.



SECTION A-A
NOT TO SCALE

NOTE: ALL SIDEWALKS WITH CENTRAL BUSINESS DISTRICT SHALL BE A MINIMUM WIDTH OF 8'

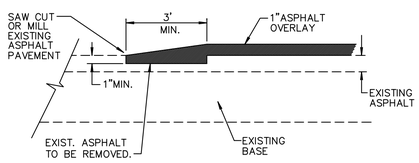
CONCRETE DRIVEWAY APRON RT 9.1



NEW CONSTRUCTION PAVEMENT JOINT

NOTE:

THIS METHOD OF PAVEMENT JOINT SHALL BE USED FOR ANY APPLICATION OR CONSTRUCTION WHERE PROPOSED PAVEMENT AND BASE WILL BE CONNECTED TO EXISTING PAVEMENT AND BASE.

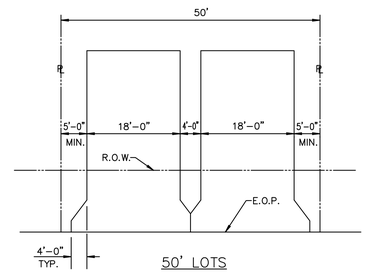


NEW OVERLAY PAVEMENT JOINT

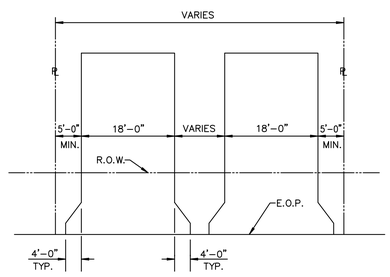
NOTE:

THIS METHOD OF PAVEMENT JOINT SHALL BE USED FOR ANY APPLICATION OR CONSTRUCTION WHERE PROPOSED PAVEMENT WILL BE CONNECTED TO EXISTING PAVEMENT.

PAVEMENT JOINT DETAIL RT 7.1

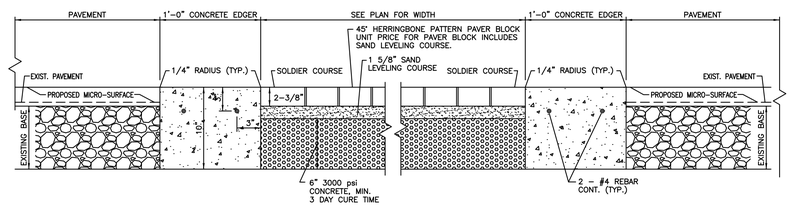


50' LOTS



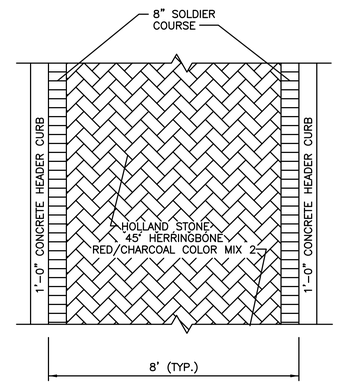
MORE THAN 50' LOTS

MINIMUM LAYOUT STANDARD FOR DUPLEX PARKING
DETAIL RT 9.3



PAVER CROSSWALK SECTION L:L

NOTE:
CONTRACTOR SHALL INCLUDE IN THE MOT PLAN, ROAD CLOSURE OF A MINIMUM OF 3 DAYS TO ALLOW FOR CURING OF THE 3000 PSI CONCRETE AT PAVER CROSSWALKS.



PAVERBRICK CROSSWALK DETAIL
NOT TO SCALE

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REVISIONS		
NO.	DATE	DESCRIPTION	BY

CAD NE2_CITY DET.DWG	
JOB NO. 1004.11	DRAWN SCC
TOTAL SHEETS 22	DESIGNED SCC
DATE 7/27/15	CHECKED BNO
SCALE N/A	QC JWR

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

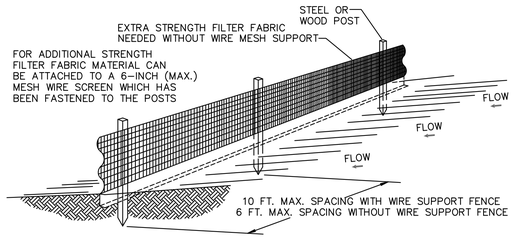
PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
DETAILS AND SPECIFICATIONS

SHEET:
C-27

1. THE INTENT OF EROSION CONTROL MEASURES INDICATED GRAPHICALLY ON PLANS IS TO PROVIDE A BARRIER TO CONTAIN SILT AND SEDIMENT ON THE PROJECT SITE. THIS REPRESENTATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE TEST OF EROSION CONTROL EFFECTIVENESS IS NOT TO BE DETERMINED BY ADHERENCE TO THE REPRESENT SET FORTH ON THE DRAWINGS AND SPECIFICATIONS, BUT BY MEETING THE REGULATIONS SET FORTH BY THE AUTHORITY HAVING JURSDICTION OVER WATER QUALITY CONTROL AND OTHER SEDIMENTATION RESTRICTION REQUIREMENTS IN THE REGION.
2. APPROVED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY CLEARING GRADING, EXCAVATION, FILLING, OR OTHER LAND DISTURBANCE ACTIVITIES, EXCEPT THOSE OPERATIONS NEEDED TO INSTALL SUCH MEASURES.
3. INSPECTION OF ALL EROSION CONTROL MEASURES SHALL BE CONDUCTED WEEKLY, OR AFTER EACH RAINFALL EVENT. REPAIR, AND/OR REPLACEMENT OF SUCH MEASURES SHALL BE MADE PROMPTY, AS NEEDED.
4. KEEP DUST WITHIN TOLERABLE LIMITS BY SPRINKLING OR OTHER ACCEPTABLE MEANS.
5. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED IF DEEMED NECESSARY BY ONSITE INSPECTION.
6. FAILURE TO PROPERLY INSTALL AND MAINTAIN EROSION CONTROL PRACTICES SHALL RESULT IN CONSTRUCTION BEING HALTED.
7. DRAINAGE INLETS SHALL BE PROTECTED BY FILTER AND GRADED ROCK AS PER INLET PROTECTION DETAIL.
8. ANY ACCESS ROUTES TO SITE SHALL BE BASED WITH CRUSHED STONE, WHERE PRACTICAL.
9. EROSION CONTROL MEASURES ARE TO BE MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
10. WHENEVER FEASIBLE, NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED.
11. ALL WORK IS TO BE IN COMPLIANCE WITH THE RULES AND REGULATIONS SET FORTH BY THE STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE CITY OF DELRAY BEACH.
12. DISCHARGE FROM DEWATERING OPERATIONS SHALL BE RETAINED ONSITE IN A CONTAINMENT AREA.

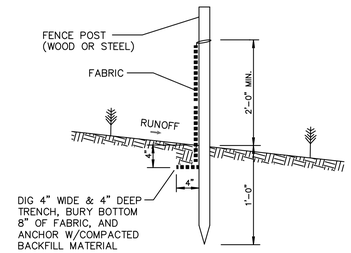
EROSION CONTROL NOTES DETAIL D9.1



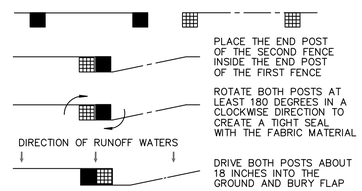
NOTES:

1. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36 INCHES (90 CM).
2. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS.
3. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET (3 M) APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES (30 CM). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL NOT EXCEED 6 FEET (1.8 M).
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4 INCHES (10 CM) WIDE AND 4 INCHES (10 CM) DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
5. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH (25 MM) LONG, TIE WIRES, OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 2 INCHES (5 CM) AND SHALL NOT EXTEND MORE THAN 36 INCHES (90 CM) ABOVE THE ORIGINAL GROUND SURFACE.
6. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 8 INCHES (20 CM) OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES (90 CM) ABOVE THE ORIGIONAL GROUND SURFACE.
7. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
8. ALL PROJECTS REQUIRE SUBMITTAL OF POLLUTION PREVENTION PLAN (PPP).
9. ALL PROJECTS 1 AC. OR MORE MUST SUBMIT NOTICE OF INTENT (NOI) TO FDEP.

SILT FENCE INSTALLATION DETAIL D 9.1a
Sheet 1 of 2

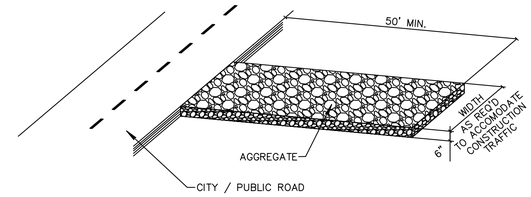


SILT FENCE SECTION
NOT TO SCALE



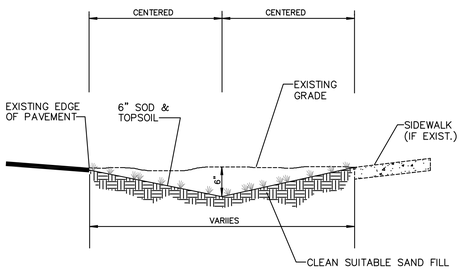
ATTACHING TWO SILT FENCES
NOT TO SCALE

SILT FENCE INSTALLATION DETAIL D 9.1b
Sheet 2 of 2



NOTE:
A CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AND CONTAIN AN AGGREGATE LAYER (FDOT AGGREGATE NO.1), AT LEAST 6–INCHES THINK. IT MUST EXTEND TO THE WIDTH OF THE VEHICULAR INGRESS AND EGRESS AREA.

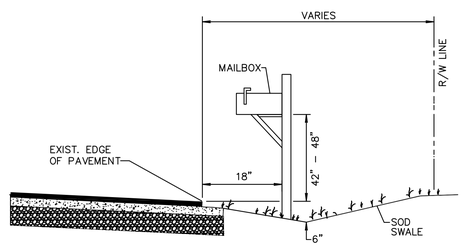
STABILIZED CONSTRUCTION ENTRANCE DETAIL D9.1C



NOTE:

1. CONTRACTOR TO REPLACE ALL IRRIGATION, TREES & SHRUBBERY IN SWALES DAMAGED DURING CONSTRUCTION.

SWALE REPLACEMENT DETAIL D10.1



NOT TO SCALE

TYPICAL MAIL BOX RELOCATION AND 6" SODDED SWALE DETAIL
DETAIL D 10.2

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REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD NE2_CITY DET.DWG		DRAWN	SCC
JOB NO.	1004.11	DESIGNED	SCC
TOTAL SHEETS	23	CHECKED	BNO
DATE	7/27/15	QC	JWR
SCALE	N/A		

ENGINEER OF RECORD
BRETT OLDFORD, P.E.
PE# 61795

PROJECT:
NE 2ND AVENUE / SEACREST
PHASE 1

TASK:
DETAILS AND SPECIFICATIONS

SHEET:
C-28

SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The work covered by these specifications comprises, in general, the furnishing of all labor, equipment, materials, and performing all operations to construct road improvements, as well as, water, sewer, and drainage improvements for the City of Delray Beach as described and specified further in the Technical Specifications and as shown on the Contract Drawings.

B. Except as specifically noted, the Contractor shall provide and pay for:

1. Labor, materials, tools, construction equipment, and machinery.
2. Water and utilities required for construction.
3. Other facilities and services necessary for proper execution and completion of the work.

C. The Contractor shall comply with all codes, ordinances, rules, regulations, orders and other legal requirements of the City of Delray Beach.

D. Roadway restoration/reconstruction for any individual street shall be completed within 30 calendar days subsequent to substantial completion of underground utility construction on a street by street basis. The submitted construction schedule shall indicate this construction sequence.

1.02 SILTATION AND BANK EROSION

The Contractor shall take adequate precautions to minimize siltation and bank erosion in the vicinity of canals or ditches, in discharging well point systems or during other construction activities.

1.03 STORAGE OF MATERIALS

Suitable storage facilities shall be furnished by the Contractor. All materials, supplies and equipment intended for use in the work shall be suitably stored by the Contractor to prevent damage from exposure, admixture with foreign substances, or vandalism or other cause. The Engineer will refuse to accept, or sample for testing, materials, supplies or equipment that have been improperly stored, as determined by the Engineer.

Materials found unfit for use shall not be incorporated in the work and shall immediately be removed from the construction or storage site. Delivered materials

shall be stored in manner acceptable to the Engineer before any payment for same will be made. Materials strung out along the line of construction will not be allowed unless the materials will be installed within one week from the time of unloading and stringing out.

1.04 PRESERVATION OF PROPERTY

The Contractor shall preserve from damage all property along the line of the work, or which is in the vicinity of or is in any way affected by the work, the removal or destruction of which is not called for by the plans. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

In case of failure on the part of the Contractor to restore such property, or make good such damage for injury, the Owner may, after 48 hours notice to the Contractor, proceed to repair, rebuild or otherwise restore such property as may be deemed necessary and the cost thereof will be deducted from any monies due or which may become due the Contractor under this contract.

1.05 CLEAN UP

The Contractor shall keep the construction site free of rubbish and other materials and restore to their original conditions those portions of the site not designated for the alteration by the Contract Documents. Clean up and restoration shall be accomplished on a continuing basis throughout the contract period and in such a manner as to maintain a minimum of nuisance and interference to the general public and residents in the vicinity of the work.

The Contractor shall also remove, when no longer needed, all temporary structures and equipment used in his operation. It is the intent of this specification that the construction areas and those other areas not designated for alteration by the Contract Documents shall be immediately restored to original condition as upon completion of the project.

1.06 PUBLIC SAFETY AND CONVENIENCE

The Contractor shall at all times so conduct his work as to ensure the least possible obstruction to traffic, or inconvenience to the general public and residents in the vicinity of the work. No road or street shall be closed to the public, except with the permission of the Engineer and other jurisdictional governmental authority, if any. Fire hydrants on or adjacent to the work shall be kept accessible. Provisions shall be made by the Contractor to ensure public access to sidewalks, public telephones, and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches. No open excavation shall be left overnight except during road closing. All

open excavation within the roadway shall be backfilled and a temporary asphalt patch applied prior to darkness each day. A cold asphalt patch is acceptable.

1.07 SAFETY AND OSHA COMPLIANCE

A. The Contractor shall comply in all respects with all Federal, State and Local safety and health regulations. Copies of the Federal regulations may be obtained from the U.S. Department of Labor, Occupation Safety and Health Administration (OSHA), Washington, DC 20210 or their regional offices.

B. The Contractor shall comply in all respects with the applicable Workman's Compensation Law.

1.08 CONTRACTOR'S USE OF PREMISES

A. Coordinate use of premises under direction of Engineer.

B. Assume full responsibility for the protection and safekeeping of equipment and materials stored on the site.

C. Move any stored Products, under Contractor's control, which interfere with operations of the Owner or separate Contractor.

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 EXPLANATION AND DEFINITIONS

A. The following explanation of the Measurement and Payment for the bid form items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the bid form or relieve the Contractor of the necessity of furnishing such as part of the Contract.

1.02 PAYMENT

A. Payment shall be made for the items listed on the Bid Form on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, clean up, and all other appurtenances to complete the construction and installation of the work to the configuration and extent as shown on the drawings and described in the specifications.
The City does not pay for items ordered and/or stored on site. Payment for pay items are paid once the item is installed, measured in place, completed and accepted.

B. It is intended that all mobilization, insurance, bond, license and other miscellaneous administrative costs, and all other costs to the Contractor not specifically identified in the following item description be distributed among and included in the unit prices stated. No additional payment shall be made for transportation, communications, office maintenance, project signs, and other incidental work or services, and no further payment shall be made for remobilization unless all of the work is suspended by the Engineer for a period in excess of three months and through no fault to the Contractor.

C. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefore shall be included in the prices named in Bid Schedule for various appurtenant items of work.

D. All required manufacturer testing and certification shall be included in the unit prices shown in the Proposal and Contract. **Density testing required for compacted backfilling, and concrete strength and materials testing required at the time of construction shall be arranged for and paid for by the Contractor.**

1.03 MEASUREMENT

A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the City.

PART 2 - MATERIALS

Not used.

PART 3 - EXECUTION

BASE BID

General Conditions

3.01 SITE MOBILIZATION – Bid Item No. 1

A. Payment for mobilization/demobilization, permits, bonds, insurance, scheduling and temporary facilities and utilities will be made at the contract Lump Sum (LS) price bid for the item, which price shall be full compensation for all materials, labor, equipment, tools, excavation, masonry and all other incidentals necessary to complete this item.

B. Payment item for mobilization shall **not exceed five percent (5%) of the base bid contract price** and shall be paid in increments in proportion to the total work completed. Should the price for Site Mobilization exceed 5% of the Contract amount, any amount over the 5% will be paid with the Contractor's final payment application.

3.02 MAINTENANCE OF TRAFFIC – Bid Item No. 2

A. The quantity of traffic control to be considered for payment shall be equivalent to the percentage of the project determined by the Engineer to be complete as of the date of the pay request submitted. The percent completion of the project shall be based on the percent of the total project actually constructed and not on the percent of the Contract price completed.

B. Payment for traffic control shall be made on the basis of a percentage (as determined in 'A' above) of the Lump Sum (LS) Price. The contract unit price shall include compensation for required labor, materials, and equipment necessary to keep roadways and property accesses in service during construction activities in accordance with the Contract Documents.

C. This item includes maintenance of traffic plan, traffic control, flagman, portable changeable (variable) message signs, detour signs, barricades, advance warning arrow panels, construction and removal of temporary access driveways to businesses and/or residential properties, etc. in order to provide safety and traffic access in accordance

with local and state requirements.

D. Contractor will need to have their detailed MOT Plan for City Roads approved by the City of Delray Beach. The MOT Plan(s) shall be approved prior to mobilizing on-site.

E. Refer to Specification Section 01570.

3.03 AS-BUILT RECORD DRAWINGS – Bid Item No. 3

A. Payment for this item shall be on a Lump Sum (LS) Basis. One set of full size design drawings on reproducible material and an electronic file of the design drawings on compact disk will be furnished to the Contractor by the City. The Contractor shall maintain full size (22" x 34") field drawings to reflect the "as-built" items of work as the work progresses. Upon completion of the work, the contractor shall prepare a record set of "as-built" drawings on full size, reproducible material and an electronic file in AutoCAD 2012 or latest version. **The As-built data shall be in State Plane Coordinates and NGVD 29.** No final payment will be made for "as-built" drawings until both the reproducible and electronic files are received and accepted by the City.

B. This item does not include surveying work required for layout and alignment of utility improvements.

C. The signed and sealed As-Built drawings prepared by professional surveyor are required to be submitted with each pay request. Measurement for payment for providing and furnishing As-Built drawings shall be based upon percent of project complete.

D. All survey work shall be performed by an independent third party surveyor, licensed to practice in the State of Florida. The surveyor shall be retained by the Contractor and approved by the City.

3.04 NPDES PERMIT/EROSION CONTROL – Bid Item No. 4 & 5

A. Payment for Contractor required NPDES Permit application (Notice of Intent and Notice of Termination), reporting and associated erosion protection measures including turbidity abatement for dewatering procedures will be made at the Contract Lump Sum (LS) Price Bid for this item. The percent completion of the project shall be based on the percent of the total project actually constructed and not on the percent of the Contract price completed.

B. Payment for NPDES Permit/Erosion Protection Measures shall be made on the basis of a percentage (as determined in 'A' above) of the Lump Sum Price. The contract lump sum price shall include compensation for required labor, materials, and equipment necessary for complying with the NPDES Permit and providing Erosion Protection Measures during construction activities in accordance with the Contract Documents.

C. Pay item includes NPDES Inspections per the permit conditions and all inlet protection

and all silt fencing required.

3.05 INDEMNIFICATION – Bid Item No. 6

A. Payment under this item is included in accordance with Article 6.30 of the General Conditions as a Lump Sum (LS) Basis.

3.06 PROJECT IDENTIFICATION SIGN – Bid Item No. 7

A. Payment for project identification sign shall be made at the contract unit price per each (EA) unit where located by the City prior to construction and shall include furnishing and maintaining the sign throughout the project duration.

B. The contractor shall schedule a field review with the City Engineer to determine the location of the Project Identification Signs.

3.07 PHOTO DOCUMENTATION/HISTORIC PHOTO INVENTORY – Bid Item No. 7

A. Payment for photographing, developing and printing of initial site conditions shall be made at the Contractor's unit price of Lump Sum (LS) and shall include all necessary labor and materials for the photographing, processing, printing and developing photographs. The photos will be prepared in accordance with the Florida Department of Transportation requirements for Local Agency Program (LAP) and associated procedures. Photos will include all properties along the project and will include property addresses, descriptions of the conditions of the historic structures and signage along the right-of-way.

B. This lump sum price shall also include all necessary labor, materials, and equipment to provide the photographs and to assemble and deliver one paper copy and one CD of the all the photographs.

C. Prior to the commencement of work the contractor shall take detailed photo documentation of both Historical Locations (fabric) and write a brief summary of their current conditions.

- The Contractor shall take all necessary measures to ensure that the historical sites remain undisturbed throughout the entirety of the project.

- Demolition of materials immediately adjacent to the Historical Site Locations shall be undertaken using non-evasive hand tools and demolition methods.

- Contractor to provide method of demolition to be approved by the City and the Florida Department of Transportation.

- Vibratory construction methods shall not be utilized for compaction and grading of sidewalks, swales, and pavement directly adjacent to the Historical Site Locations.

- Contractor to take detailed photo documentation and provide a descriptive summary of both Historical Site Locations (fabric) prior to the final inspection.

If during the construction phase of this project and Historical Site Locations (fabric) are damaged, construction shall be halted and the contractor shall notify the Florida Department of State – Division of Historical Resources and the City of Delray Beach, immediately.

3.08 UNFORESEEN CONDITIONS ALLOWANCE – Bid Item No. 9

A. Payment under this item shall be made as stipulated in Specifications Section 01020 - Allowances.

3.09 VIDEO ALLOWANCE – Bid Item No. 10

A. Payment under this item shall be made on a lump sum (LS) basis.

Demolition

3.10 CLEARING AND GRUBBING – Bid Item No. 11

A. Payment for this item shall be made on a Lump Sum (LS) basis. The Contractor's unit price shall include full compensation for all excavation necessary within the road right of way including debris removal, grading, and any other required clearing and grubbing in accordance with the plans and specifications, except for any areas designated to be paid for separately or to be specifically included in the costs of other work under the Contract.

B. The Contractor shall remove and dispose of all bushes, trees, stumps, roots, fill material, debris, and other such protruding objects, appurtenances, fences, or any other facilities to prepare the area within the Right-of Way for construction of the proposed improvements. This item shall include the relocation of all mailboxes, signs, removal and reinstallation of all irrigation piping, irrigation heads, walls, fencing, trees, and other such appurtenances that conflict with the proposed improvements or is shown to be relocated.

3.11 REMOVE EXISTING CONCRETE SIDEWALK (VARYING WIDTH) – Bid Item Nos. 29.1 & 29.2

A. Payment for this item shall be on a Linear Foot (LF) Basis. The Contractor's unit price shall include full compensation for labor, materials and equipment required to remove concrete sidewalks (varying width) as indicated on the plans.

B. The Contractor shall cut, remove and legally dispose of all concrete sidewalks as indicated on the plans.

3.12 REMOVE EXISTING DRIVEWAY (VARYING TYPES) – Bid Item No. 12

A. Payment for this item shall be on a Square Yard (SY) Basis. The Contractor's unit price shall include full compensation for labor, materials and equipment required to remove driveways (varying types) as indicated on the plans.

B. The Contractor shall cut, remove and legally dispose of all asphalt, concrete, gravel or any other type of driveway as indicated on the plans.

3.13 REMOVE EXISTING PAVEMENT SECTION (ASPHALT AND ROADBASE) – Bid Item No. 13 & 28.3

A. Payment for this item shall be made on a Square Yard (SY) Basis. The Contractor's unit price shall include full compensation for labor, materials and equipment required for all pavement section (asphalt pavement and base material– varying thickness) removal necessary within the road right of way as indicated on the plans, except for any areas designated to be paid for separately or to be specifically included in the costs of other work under the Contract.

B. The Contractor shall cut, remove and legally dispose of existing roadway pavement and concrete curbing (this includes removing shellrock and limestone where applicable), or any other facilities to prepare the area within the easements and rights-of-way for construction of the proposed improvements as indicated on the plans. This includes saw cuts and joints at connections to existing pavement and saw cutting the pavement at each driveway location.

C. Also included in this item is all restoration work (sod, driveways, sidewalk, etc.) that is required due to removing pavement section.

Roadway

3.14 MILL 1" ASPHALT & OVERLAY 1” TYPE SP 9.5 ASPHALT - Bid Item No. 14 & 28.4

A. Payment for 1-inch milling and installing new 1” Type SP 9.5 – 1 lift asphalt overlay, where indicated on the plans shall be made at the Contractor’s unit price per Square Yard (SY) for 1-inch milling and Type SP 9.5 asphalt overlay and shall include all labor, material, and equipment required to mill 1-inch of existing asphalt and construct 1” Type SP 9.5 asphaltic concrete overlay as shown on the plan view and detail drawings. The unit price shall include compensation for multiple mobilizations, labor, materials, and equipment required to mill existing pavement and to construct the new Type SP 9.5 asphaltic surface overlay with tack coat.

B. This unit price shall also include all necessary labor, materials, and equipment to adjust the valve boxes, manholes, rims, inlets, or other fixtures to final grade, transitions to existing pavement, tack coating, compaction, rolling, brooming, asphalt testing, and any other work required to complete the work.

3.15 VARIABLE MILLING AND ASPHALT OVERBUILD (2" MAX)- Bid Item No. 15

A. If variable milling and resurfacing is required to perform the contracted work, the contractor shall notify the City Engineer and schedule a field review of the area(s).

B. Payment for 2-inch maximum variable milling and installing new 2" maximum Type SP 9.5 – 1 lift asphalt overbuild, where required to remove asphalt cracks and maintain City minimum slopes shall be made at the Contractor's Lump Sum (LS) for variable milling and Type SP 9.5 asphalt overbuild and shall include all labor, material, and equipment required to mill 2" maximum of existing asphalt and construct 2" maximum Type SP 9.5 asphaltic concrete overbuild as required to maintain City minimum slopes and detail drawings. The unit price shall include compensation for multiple mobilizations, labor, materials, and equipment required to mill existing pavement and to construct the new Type SP 9.5 asphaltic surface overbuild with tack coat.

C. This unit price shall also include all necessary labor, materials, and equipment to adjust the valve boxes, manholes, rims, inlets, or other fixtures to final grade, transitions to existing pavement, tack coating, compaction, rolling, brooming, asphalt testing, and any other work required to complete the work.

3.16 8" COMPACTED LIMEROCK BASE – Bid Item No. 16 & 30.5

A. Payment for installing new 8-inch compacted limerock base including primer and tack coats where indicated on the plans shall be made at the Contractor's unit price per Square Yard (SY) for limerock base installed and accepted.

B. The Contract Unit Price shall include compensation for labor, materials, equipment and testing required to construct the new limerock base, including primer and tack coats in accordance with the plans and specifications.

3.17 ASPHALT PAVEMENT – 1-1/2" TYPE SP-9.5 ASPHALT (2 LIFTS) – Bid Item No. 17 & 30.6

A. Payment for installing new 1-1/2" Type SP-9.5 asphalt pavement (two 00.75" lifts), including tack coat, where indicated on the plans shall be made at the Contractor's unit price per Square Yard (SY) for Type S-9.5 asphalt pavement and shall include all labor, material, and equipment required to construct 2-1/2" asphaltic concrete as required due to construction activities. The unit price shall include compensation for labor, materials, and equipment required to construct the new asphaltic surface.

B. This unit price shall also include all necessary labor, materials, and equipment to adjust the valve boxes, manholes, rims, inlets, or other fixtures to final grade, transitions to existing pavement, tack coating, compaction, rolling, brooming, asphalt testing and any other work required to complete the work.

C. This item also includes installing an asphalt taper around all structures in roadway, if both ¾" lifts are not installed within 24 hours.

3.18 12" STABILIZED SUBGRADE – Bid Item No. 18 & 30.7

A. The unit price bid per Square Yard (SY) for the stabilized subgrade (12" thick, LBR 40) shall include all labor, material, and equipment required to construct the subgrade as shown on the detail drawings. The unit price shall include all excavation, line cutting of existing pavement, preparation of subgrade, fine grading, placement of subgrade material, compaction, rolling, brooming, and other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and City of Delray Beach specifications.

3.19 COLORED ASPHALT COATING – Bid Item No. 19

A. Payment for installing new Colored asphalt coating – bike lane where indicated on the plans shall be made at the Contractor's square yard (SY) Basis for colored asphalt coating applied a minimum of 36 dry mills, installed and accepted.

B. The Contract lump sum price shall include compensation for labor, materials, and equipment required to apply new colored asphalt coating in accordance with the manufactures surface preparation installation and clean-up. No deduction will be made for area(s) occupied by manholes, inlets, drainage structures, bollards or by any public appurtenances within the area.

C. Contractor to use approved materials stated in the FDOT Section 523 and the FDOT Qualified Products List **AND** have FHWA Approval.

D. The Contractor shall match the existing bike lane color used in FM 431650-1-58-01

3.20 CONCRETE CURBS & GUTTER – Bid Items No. 19, 20, 30.2

A. The quantity of curbs and/or gutter shall be determined by measurement of the units Linear Foot (LF) installed and accepted.

B. Payment for furnishing and installing concrete curbs and gutters shall be made at the contract unit price per linear foot of each type concrete curb and/or gutter, including flared ends and transitions, rebar (as applicable) installed and accepted. The contract

unit price shall include all labor, materials, and equipment necessary to prepare and test the sub-base and install the concrete curbs and/or gutter in accordance with the plans and specifications.

C. Refer to "CURB AND GUTTER SECTIONS" detail on sheet C-22.

3.21 5' WIDE (4" & 6" THICK) CONCRETE SIDEWALK – Bid Item No. 22, 23, 31.3 & 31.4

A. Payment for sidewalks where indicated on the plans and specifications per City Detail – RT 5.1, shall be made at the Contractor's unit price per Linear Foot (LF) of sidewalk installed and accepted. The Contract Unit Price shall include full compensation for labor, material, equipment and testing required to install the sub-base and sidewalk in accordance with the plans and specifications.

B. Payment shall be made for sidewalks constructed or replaced by authorization of the Engineer. Any sidewalk that is broken incidental to construction shall be replaced at the Contractor's expense.

3.22 CONCRETE DRIVEWAY APRON – Bid Item No. 24

A. The quantity of concrete drive aprons shall be determined by measurement of the units per Square Foot (SF) installed and accepted.

B. Payment for furnishing and installing 6-inch thick concrete drive aprons shall be made at the contract unit price per square foot of apron installed and accepted. The contract unit price shall include full compensation for all labor, materials, equipment and testing necessary to install the sub-base and concrete drive aprons in accordance with the plans and specifications.

C. Concrete driveway apron replacement beyond the limits established by the project construction drawings will not be considered for payment.

3.23 PAVER BRICK AT CURB RAMPS INCLUDING TACTILE SURFACE PAVERS – Bid Items No. 25

A. Payment for this item shall be made at the Contractor's unit price per Square Yard (SY) of curb ramp installed and accepted. The Contractor's unit price shall include full compensation for furnishing and installing the curb ramps including the provision of "brick red" truncated dome paver brick located at tactile surface locations. Ramp slopes and dimensions shall be constructed per FDOT Index 304 at the locations shown on the Drawings. The curb ramps shall be in accordance with the plans, details, and specifications.

B. The paver brick color selection shall be "brick red" as indicated on the plans and as approved by the City during the shop drawing process.

C. The Contract Unit Price shall also include adjustment of existing paver bricks to proposed grades including provision of additional sand or adjustments to the subgrade in order to match proposed back of curb elevations or in order to relocate curb ramps, and any sub-base or concrete testing.

D. Refer to "DETECTABLE WARNING RAMP IN PAVER SIDEWALK TYPICAL DETAIL" on sheet C-22.

3.24 SWALE GRADING AND SODDING – Bid Item No. 26

A. Payment for this item shall be made on a Square Yard (SY) basis. The Contractor's unit price shall include full compensation for all swale grading and sodding within the road right of way as indicated on the plans.

B. The Contractor's unit price shall constitute full compensation for all labor, materials, and equipment required for excavation, grading, hauling, placing, compacting, and dressing of the surface of the swales in preparation for sodding, placement, and maintenance of the Bahia sod or St. Augustine sod.

3.25 PEDESTRIAN SIGNAL, LED, COUNTDOWN, 1 DIRECTION "Complete" – Bid Item No. 27

A. Payment shall be made on a unit price per each (EA) pedestrian signal installed and accepted by the City. Payment shall include the design and installation of a complete and operable system, including the furnishing of all labor, equipment, material and supervision necessary to construct the irrigation system. Contractor will be responsible for installing a complete and operational system including but not limited to control wire, connection to existing controllers, modifying existing pedestrian signals, pedestals, foundations, transformer bases, signs, connection to existing poles, modifying existing control boxes, traffic loops, pull boxes, etc. and signal testing.

B. A professional Signal Contractor with proper licenses will be required to do the work.

C. Signal materials and design specifications shall be in accordance with the local and/or state agencies. Refer to the FDOT Standard Specifications for Road and Bridge Construction for Traffic Control and Signal Devices. See ***Appendix B***

3.26 SIGNING AND PAVEMENT MARKINGS – Bid Item No. 28

A. The Lump Sum (LS) bid price shall include all labor, material, and equipment required for all thermoplastic pavement markings, pedestrian and traffic control signs, and symbols and reflective markers that are to be replaced in areas of roadway resurfacing. This

includes all stop conditions. All pavement marking shall be thermoplastic. The lump sum prices hall include all materials, equipment, preparation, and other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Section 711, the MUTCD, Palm Beach County requirements and City of Delray Beach specification.

B. The unit price includes all temporary (traffic paint) pavement markings required until the permanent thermoplastic pavement markings are installed.

3.27 IRRIGATION MODIFICATION - Bid Item No. 29

A. Payment for modifying existing irrigation where indicated on the plans shall be made at the Contractor's unit price per LUMP SUM (LS) of irrigation modifications installed and accepted. The Contract Unit Price shall include compensation for labor, material, connection to irrigation mains, valves, sleeves, lateral zone piping, bubblers, spray heads equipment and testing required to furnish and install irrigation modifications. The design shall be field coordinated by the Contractor.

B. A professional Irrigation Company with proper licenses will be required to do the work.

3.28 PAVER CROSS-WALK @ INTERSECTIONS - Bid Item No. 30.1

A. Payment for installing new paver brick crosswalks where indicated on the plans shall be made at the Contractor's unit price per Square Foot (SF) of crosswalk installed and accepted. The Contract Unit Price shall include compensation for labor, material, equipment and testing required to furnish and install the new paver brick surface course, including 6 inches 3,000 psi Portland cement concrete base and sand leveling courses, in accordance with the plans and specifications

B. Paver brick color, laying pattern and manufacturer selection shall be as specified on the plans and as approved by the City during the shop drawing process.

C. Refer to “PAVER CROSSWALK” on sheet C-23.

3.29 2.5" MILLING - Bid Item No. 32.1

A. Payment for 2.5-inch milling, where indicated on the plans shall be made at the Contractor’s unit price per Square Yard (SY) for 2.5-inch milling and shall include all labor, material, and equipment required to mill 2.5-inch of existing asphalt as shown on the plan view and detail drawings. The unit price shall include compensation for multiple mobilizations, labor, materials, and equipment required to mill existing pavement and any other work required to complete the work.

3.30 ASPHALT RUBBER MEMBRANE INTERLAYER (ARMI) INCLUDES No. 6 AGGREGATE - Bid Item Nos. 32.2 & 32.3

A. Payment for installing ARMI layer where indicated on the plans shall be made at the Contractor's unit price per Square Yard (SY) of ARMI installed and accepted. The Contract Unit Price shall include compensation for labor, material, equipment and testing required to furnish and install the ARMI Layer in accordance with the plans and FDOT Specification 341.

B. Payment shall also include clean No. 6 aggregate in accordance with the FDOT Flexible Pavement Design Manual.

END OF SECTION

SECTION 01041
PROJECT COORDINATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Engineer will coordinate the work between Prime Contractors as required.

B. [The] [Each Prime] Contractor shall:

1. Coordinate work of his [own] employees and subcontractors.
2. Expedite his work to assure compliance with schedules.
3. [Coordinate his work with that of other Prime Contractors and work by Owner.]
4. Comply with orders and instructions of Engineer.

1.02 RELATED REQUIREMENTS

A. Section 01152: Applications for Payment.

B. Section 01200: Project Meetings.

C. Section 01340: Shop Drawings, Product Data and Samples.

D. Section 01700: Contract Closeout.

1.03 CONSTRUCTION ORGANIZATION AND START-UP

A. Engineer shall establish on-site lines of authority and communications:

1. Schedule and conduct pre-construction meeting and progress meetings as specified in Section.
2. Establish procedures for [intra-project communications]:
   a. Submittals
   b. Reports and records
   c. Recommendations
   d. Coordination of drawings
   e. Schedules
   f. Resolution of conflicts
3. Interpret Contract Documents:
   a. Transmit written interpretations to [Prime] Contractors, and to other concerned parties.
4. Assist in obtaining permits and approvals:

a. Verify that contractor[s] and subcontractors have obtained inspections for Work and for temporary facilities.

5. Control the use of Site:
   a. Allocate space for [each Prime] Contractor's use for field offices, sheds, and work and storage areas.
6. Inspection and Testing:
   a. Inspect work to assure performance in accord with requirements of Contract Documents.
   b. Administer special testing and inspections of suspect Work.
   c. Reject Work which does not comply withrequirements of Contract Documents.

1.04 CONTRACTOR'S DUTIES

A. Construction Schedules:

1. Prepare a detailed schedule of basic operations.
2. Monitor schedules as work progresses:
   a. Identify potential variances between scheduled and probable completion dates or each phase.
   b. Recommend to Owner adjustments in schedule to meet required completion dates.
   c. Document changes in schedule; submit to Owner, Engineer and to involved subcontractors.
3. Observe work of each subcontractor to monitor compliance with schedule.
   a. Verify that labor and equipment are adequate for the work and the schedule.
   b. Verify that product procurement schedules are adequate.
   c. Verify that product deliveries are adequate to maintain schedule.
   d. Report noncompliance to Engineer, with recommendation for changes.

B. Process Shop Drawings, Product Data and Samples:

1. Prior to submittal to Engineer, review for compliance with Contract Documents:
   a. Field dimensions and clearance dimensions.
   b. Relation to available space.
   c. Effect of any changes on the work of any subcontractor.

C. Prepare Coordination Drawings as required to resolve conflicts and to assure coordination of the work of, or affected by, mechanical and electrical trades, or by special equipment requirements.

1. Submit to Engineer.

2. Reproduce and distribute copies to concerned parties after Engineer review.

D. Maintain Reports and Records at Job Site, available to Engineer and Owner.

1. Daily log of progress of work.
2. Records
   a. Contracts
   b. Purchase orders
   c. Materials and equipment records
   d. Applicable handbooks, codes and standards
3. Maintain file of record documents

1.05 CONTRACTOR'S CLOSE-OUT DUTIES

A. At completion of Work, conduct an inspection to assure that:

1. Specified cleaning has been accomplished.
2. Temporary facilities have been removed from site.

B. Substantial Completion:

1. Conduct an inspection to develop a list of Work to be completed or corrected.
2. Assist Engineer in inspection.
3. Supervise correction and completion of work of subcontractors.

1.06 ENGINEER'S CLOSE-OUT DUTIES

A. Final Completion:

1. When [each] Contractor determines that Work is finally complete, conduct an inspection to verify completion of Work.

B. Administration of Contract closeout:

1. Receive and review contractor's final submittals.
2. Transmit to Owner with recommendations for action.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01045
CUTTING AND PATCHING

PART 1- GENERAL

1.01 REQUIREMENTS INCLUDED

A. Contractor shall be responsible for all cutting, fitting and patching, including related excavation and backfill, required to complete the Work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the Work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirement of Contract Documents.
5. Remove samples of installed work as specified for testing.
6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01630: Substitutions and Product Options.

1.03 SUBMITTALS

A. Submit a written request to Engineer well in advance of executing and cutting or alteration which affects:

1. Work of the Owner or any separate contractor.
2. Structural value or integrity of any element of the project.
3. Integrity or effectiveness of weather-exposed or moisture-resistant element or systems.
4. Efficiency, operational life, maintenance or safety of operational elements.
5. Visual qualities of sight-exposed elements.

B. Request shall include:

1. Identification of the Project.
2. Description of affected work.
3. The necessity for cutting, alteration or excavation.

4. Effect on work of Owner or any separate contractor, or on structural or weatherproof integrity of Project.
5. Description of proposed work:
   a. Scope of cutting, patching, alteration, or excavation.
   b. Trades who will execute the work.
   c. Products proposed to be used.
   d. Extent of refinishing to be done.
6. Alternative to cutting and patching.
7. Cost proposal, when applicable.
8. Written permission of any separate contractor whose work will be affected.

C. Should conditions of Work or the schedule indicate a change of products from original installation, contractor shall submit request for substitution as specified in Section 01630 - Substitutions and Product Options.

D. Submit written notice to Engineer designating the date and the time the Work will be uncovered.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.

C. Report unsatisfactory or questionable conditions to Engineer in writing; do not proceed with work until Engineer has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.

B. Provide devices and methods to protect other portions of Project from damage.

C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.03 PERFORMANCE

A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Employ original Installer or Fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant elements.
2. Sight-exposed finished surfaces.

D. Execute fittings and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

E. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of Contract documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit or other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes;

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish entire unit.

END OF SECTION

SECTION 01050
FIELD ENGINEERING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide and pay for field engineering services required for Project.

1. Survey work required in execution of Project.
2. Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.

B. Owner's Representative will identify existing control points indicated on the Drawings, as required.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.

B. Section 01010: Summary of Work.

C. Section 01700: Contract Closeout.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEER

A. Qualified engineer or land surveyor, registered in the State of Florida.

1.04 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points for the Project are those designated on Drawings.

B. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to Engineer.
2. Report to Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
3. Require surveyor to replace project control points which may be lost or destroyed.
   a. Establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements
   a. Stakes for grading, fill and topsoil placement.
   b. Utility slopes and invert elevations.
2. Batter boards for structures.
3. Building foundation, column locations and floor levels.
4. Controlling lines and levels required for mechanical and electrical trades.

B. From time to time, verify layouts by same methods.

C. Locate and mark all known underground utilities prior to entrance of any equipment on the site. All such utilities shall be protected from heavy traffic. Establish and maintain barricades around all manholes, drains, and similar underground items. Immediately notify the owner of any conflict between operations and any in ground item to remain.

1.06 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.

1.07 SUBMITTALS

A. Submit name and address of registered surveyor and Professional Engineer to Engineer.

B. On request of Engineer, submit documentation to verify accuracy of field engineering work.

C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01090
REFERENCE STANDARDS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Abbreviation and acronyms used in Contract Documents to identify reference standards.

1.02 QUALITY ASSURANCE

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.

B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS, NAMES, AND ADDRESSES OR ORGANIZATIONS

A. Obtain copies of referenced standards direct from publication source, when needed for proper performance of Work, or when required for submittal by Contract Documents.

AA	Aluminum Association 818 Connecticut Avenue, N.W. Washington, DC 20006
AABC	Associated Air Balance Council 1000 Vermont Avenue, N.W. Washington, DC 20005
AASHTO	American Association of State Highway & Transportation Officials 444 North Capitol Street, N.W. Washington, DC 20001
ACI	American Concrete Institute Box 19150 Redford Station Detroit, MI 48219

ADC	Air Diffusion Council 435 North Michigan Avenue Chicago, IL 60611
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AISC	American Institute of Steel Construction 1221 Avenue of the Americas New York, NY 10020
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, DC 20036
AMCA	Air Movement and Control Association 30 West University Drive Arlington Heights, Il 60004
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
ARI	Air-Conditioning and Refrigeration Institute 1815 North Fort Myer Drive Arlington, VA 22209
ASHRAE	American Society of Heating, Refrigerating & Conditioning Engineers 345 East 47th Street New York, NY 10017
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASPA	American Sod Producers Association Association Building Ninth and Minesota Hastings, NE 68901

ASTM	American Society of Testing & Materials 1916 Race Street Philadelphia, PA 19103
AWWA	American Water Works Assocation 6666 W. Quincy Avenue Denver, CO 80235
AWI	Architectural Woodwork Institute 2310 South Walter Reed Drive Arlington, VA 22206
AWPA	American Wood-Preserver's Association 7735 Old Georgetown Road Bethesda, MD 20014
AWS	American Welding Society 2501 NW 7th Street Miami, FL 33125
CDA	Cooper Development Association 57th Floor, Chrysler Building 405 Lexington Avenue New York, NY 10017
CLFMI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue Washington, DC 20036
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite 2110 Chicago, IL 60601
MF	Factory Mutual System 1151 Boston Providence Turnpike Norwood, MA 02062
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, DC 20407
GA	Gypsum Association

	1603 Orrington Avenue Evanston, IL 60201
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MLSFA	Metal Lath/Steel Framing Association 221 North LaSalle Street Chicago, IL 60601
NAAMM	National Association of Architectural Metal Manufacturers 221 North LaSalle Street Chicago, IL 60601
NEBB	National Environmental Balancing Bureau 8224 Old Courthouse Road Vienna, VA 22180
NEMA	National Electrical Manufacturer's Association 2101 L Street, N.W. Washington, DC 20037
NFPA	National Fire Protection Association 470 Atlantic Avenu Boston, MA 02210
NFPA	National Forest Products Association 1619 Massachusetts Avenue, N.W. Washington, DC 20036
NTMA	National Terrazzo and Mosaic Association 3166 Des Plains Avenue Des Plains, Il 60018
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606
PS	Product Standard U.S. Department of Commerce

	Washington, DC 20203
RCSHSB	Red Cedar Shingle & Handsplit Shake Bureau 515 116th Avenue Bellevue, WA 98004
SDI	Steel Deck Institute Box 3812 St. Louis, MO 63122
SDI	Steel Door Institute 712 Lakewood Center North Cleveland, OH 44107
SIGMA	Sealed Insulating Glass Manufacturers Association 111 East Wacker Drive Chicago, IL 60601
SJI	Steel Joist Institute 1703 Parham Road, Suite 204 Richmond, VA 23229
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 8224 Old Court House Road Vienna, VA 22180
TAS	Technical Aid Series Construction Specifications Institute 1150 Seventeenth Street, N.W. Washington, DC 20036
TCA	Tile Council of America, Inc. Box 326 Princeton, NJ 08540
UL	Underwriter's Laboratories, Inc. 333 Pfingston Road Northbrook, Il 60062

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01152
APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit Applications for Payment to Engineer in accordance with the schedule established by Conditions of the Contract and herein.

1.02 RELATED REQUIREMENTS

A. Agreement Between Owner and Contractor: Lump Sum and Unit Price.

B. Conditions of the Contract: Progress Payments, Retainage and Final Payment.

C. Section 01020: Allowances.

D. Section 01153: Change Order Procedures.

E. Section 01370: Schedule of Values.

F. Section 01700: Contract Closeout.

1.03 FORMAT AND DATA REQUIRED

A. Submit applications in the form required by Owner, in accordance with the example which will be provided by the Engineer, with itemized data typed on 8-1/2 inch x 11 inch white paper continuation sheets.

B. Provide itemized data on continuation sheet:

1. Format, schedules, line items and values: Those of the Schedule of Values accepted by Engineer.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets:

1. Fill in total list of all scheduled component items of Work, with item number and scheduled dollar value for each item.
2. Fill in dollar value in each column for each scheduled line item when work has been preformed or products stored.
   a. Round off values to nearest dollar, or as specified for Schedule of Values.
3. List each Change Order executed prior to date of submission at the end of the continuation sheets.
   a. List by Change Order Number, and description,as for an original component item of work.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project
2. Application number and date.
3. Detailed list of enclosures.
4. For stored products:
   a. Item number and identification as shown on application.
   b. Description of specific material.

B. Submit one copy of data and cover letter for each copy of application.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

1.07 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to Engineer at the times stipulated.

B. Number: [4] copies of Application.

C. When Engineer finds Application properly completed and correct, he will transmit certificate for payment to Owner, with copy to Contractor.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01153
CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Promptly implement change order procedures.

1. Provide full written data required to evaluate changes.
2. Maintain detailed records of work done on time and material/force account basis.
3. Provide full documentation to Engineer on request.

B. Designate in writing the member of Contractor's organization:

1. Who is authorized to accept changes in the Work.
2. Who is responsible for informing others in the Contractor's employ of the authorization of changes in the Work.

C. Owner will designate in writing the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

A. Agreement: The amounts of established unit prices.

B. General conditions and Supplementary Conditions.

C. Conditions of the Contract:

1. Methods of determining cost or credit to Owner resulting from changes in Work made on a time and material basis.
2. Contractor's claims for the additional cost.

D. Section 01020: Allowances.

E. Section 01152: Application for Payment.

F. Section 01310: Construction Schedules.

G. Section 01370: Schedule of Values.

H. Section 01630: Substitutions and Product Options.

I. Section 01700: Contract Closeout.

1.03 DEFINITIONS

A. Change Order: See General Conditions and Supplementary Conditions.

B. Construction Change Authorization: A written order to the Contractor, signed by Owner and Engineer, which amends the Contract Documents as described, and authorizes Contractor to proceed with a change which affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.

C. Field Order: A written order, instructions, or interpretations, signed by Engineer making minor changes in the Work not involving a change in Contract Sum or Contract Time.

1.04 PRELIMINARY PROCEDURES

A. Owner or Architect may initiate changes by submitting a Proposal Request to Contractor. Request will include:

1. Detailed description of the Change, products, and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
4. A specific period of time during which the requested price will be considered valid.
5. Such request is for information only, and is not an instruction to execute the changes, nor to stop Work in progress.

B. Contractor may initiate changes by submitting a written notice to Architect, containing:

1. Description of the proposed changes.
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.05 CONSTRUCTION-CHANGE AUTHORIZATION

A. In lieu of Proposal Request, Engineer may issue a construction change authorization for Contractor to proceed with a change for subsequent inclusion in a Change Order.

B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.

C. Owner and Engineer will sign and date the Construction Change Authorization as authorization for the Contractor to proceed with the changes.

D. Contractor shall sign and date the Construction Change Authorization to indicate agreement with the terms therein.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Engineer to evaluate the quotation.

B. On request provide additional data to support time and cost computations:

1. Labor required.
2. Equipment required.
3. Products required.
   a. Recommended sources of purchase and unit cost.
   b. Quantities required.
4. Taxes, insurance and bonds.
5. Credit for work deleted from Contract, similarly documented.
6. Overhead and profit.
7. Justification for any change in Contract Time.

C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information:

1. Name of Owner's authorized agent who ordered the work, and date of the order.
2. Dates and times work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
   a. Equipment used, listing dates and times of use.
   b. Products used, listing of quantities.
   c. Subcontractors.

D. Document requests for substitutions for Products as specified in Section 01630.

1.07 PREPARATION OF CHANGE ORDERS

A. Engineer will prepare each Change Order.

B. Owner's Form, per example provided by the Engineer.

C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contact Time.

1.08 LUMP-SUM/FIXED PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either;

1. Engineer's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.
2. Contractor's Proposal for a change, as recommended by Engineer.

B. Owner and Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

1.09 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Engineer's definition of the scope of the required changes.
2. Contractor's Proposal for a change, as recommended by Engineer.
3. Survey of completed work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.
2. Those mutually agreed upon between Owner and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:

1. Owner and Engineer will sign and date the Change Order as authorization for Contractor to proceed with the changes.
2. Contractor shall sign and date the Change Order to indicate agreement with the terms herein.

D. When quantities of the items cannot be determined prior to start of the work:

1. Engineer or Owner will issue a construction change authorization directing Contractor to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.
2. At completion of the change, Engineer will determine the cost of such work based on the unit process and quantities used.
   a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
3. Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
4. Owner and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/ CONSTRUCTION CHANGE AUTHORIZATION

A. Engineer and Owner will issue a Construction Change Authorization directing Contractor to proceed with the changes.

B. At completion of the change, Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.

C. Engineer will determine the allowable cost for such work, as provided in General Conditions and
Supplementary Conditions.

D. Engineer will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.

E. Owner and Contractor will sign and date the Change Order to indicate their agreement therewith.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract sum.

B. Periodically revise the Construction Schedule to reflect each change in Contract Time.

1. Revise subschedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Owner shall schedule and administer preconstruction meeting, periodic progress meetings, and specially called meetings throughout progress of the Work.

1. Prepare agenda for meetings.
2. Distribute written notice of each meeting four days in advance of meeting date.
3. Make physical arrangements for meetings.
4. Preside at meetings.
5. Record the minutes; include significant proceedings and decisions.
6. Reproduce and distribute copies of minutes within three days after each meeting.
   a. To participants in the meeting.
   b. To parties affected by decisions made at the meeting.

B. Representatives of contractors, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 RELATED REQUIREMENTS

A. Instructions to Bidders: Pre-Bid Conferences.

B. Section 01340: Shop Drawings, Product Data and Samples.

C. Section 01700: Contract Closeout.

D. Section 01730: Operating and Maintenance Data.

1.03 PRE-CONSTRUCTION MEETING

A. Schedule within 20 days after effective date of the agreement.

B. Location: A central site, convenient for all parties, designated by the Owner.

C. Attendance:

1. Owner's Representative.

2. Engineer and his professional consultants.
3. Resident Project Representative.
4. Contractor's Superintendent.
5. Major Subcontractors.
6. Others as Appropriate and approved by the Owner.

D. Suggested Agendum:

1. Distribution and discussion of:
   a. List of major subcontractors and suppliers.
   b. Projected Construction Schedules.
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project Coordination.
   a. Designation of responsible personnel.
5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders.
   e. Applications for Payment.
6. Adequacy for distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of premises.
   a. Office, work and storage areas.
   b. Owner's requirements.
9. Construction facilities, controls and construction aids.
10. Temporary utilities.
11. Safety and first-aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Miscellaneous.

1.04 PROGRESS MEETINGS

A. Schedule regular periodic meetings, as required.

B. Hold called meetings as required by progress of the Work.

C. Location of the meetings: Project field office of the Contractor or other site directed by the Engineer.

D. Attendance:

1. Engineer, and his professional consultants as needed.
2. Subcontractors as appropriate to the agenda.

3. Suppliers as appropriate to the agenda.
4. Others.

E. Suggested Agenda:

1. Review, approval of minutes of previous meeting.
2. Review of Work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review of submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:
    a. Effect on Construction Schedule and on completion date.
    b. Effect on other contracts relating to the project.
14. Review of record drawings.
15. Other business.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Promptly after award of the Contract, prepare and submit to Engineer estimated construction progress schedules for the Work, with subschedules of related activities which are essential to its progress.

B. Submit revised progress schedules to maintain proposed schedule within 30 days of work in place.

1.02 RELATED REQUIREMENTS

A. Conditions of the Contract.

B. Section 01010: Summary of Work.

C. Section 01020: Allowances.

D. Section 01041: Project Coordination.

E. Section 01200: Project Meetings.

F. Section 01340: Shop Drawings.

1.03 FORM OF SCHEDULES

A. Prepare schedules in the form of:

1. Horizontal Bar Chart.
2. Network Analysis System.
3. Other Method Accepted by Owner.

B. Format of Listings: The chronological order of the start of each item of work.

1.04 CONTENT OF SCHEDULES

A. Construction Progress Schedule:

1. Show the complete sequence of construction by activity.

2. Show the dates for the beginning, and completion of each major element of construction. Specifically list:
   a. Site clearing.
   b. Site utilities.
   c. Foundation work.
   d. Structural framing.
   e. Subcontractor work.
   f. Equipment installations.
   g. Delivery of O & M Manuals.
   h. Finishings.
   i. Start-up

B. Submittals, Schedule for Shop Drawings, Product Data and Samples. Show:

1. The dates for Contractor's Submittals.
2. The dates revised submittals will be required from the Engineer.

C. Provide subschedules to define critical portions of prime schedules.

1.05 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other prime contractors.

1.06 SUBMISSIONS

A. Submit initial schedules within 10 days after the effective date of the Agreement.

1. Engineer will review schedules and return review copy within 10 days after receipt.
2. If required, resubmit within seven days after return of review copy.

B. With each application for payment, submit progress schedule if revised since last payment request.

C. Submit one reproducible transparency which will be returned to the Contractor, plus two copies which will be retained by the Engineer.

1.07 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Job site file.
2. Subcontractors.
3. Other concerned parties.

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01340
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Submit Shop Drawings, Product Data and Samples required by Contract Documents.

1.02 RELATED REQUIREMENTS

A. Definitions and Additional Responsibilities of Parties: Conditions of the Contract.

B. Section 01700: Contract Closeout.

1.03 SHOP DRAWINGS

A. Drawings shall be presented in a clear and Thorough manner.

1. Details shall be identified by reference of sheet and detail or schedule.

B. Minimum sheet size: 8½ X 11 inches.

1.04 PRODUCT DATA

A. Preparation

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.

B. Manufacture's standard schematic drawings and diagrams:

1. Modify drawings and diagrams by deleting information which is not applicable to the work.
2. Supplement standard information to provide information specifically applicable to the work.

1.05 CONTRACTOR RESPONSIBILITIES

A. Review Shop Drawings, Product Data and Samples prior to submission.

B. Determine and verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with specifications.

C. Coordinate each submittal with requirements of the Work and of the Contract Documents.

D. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the contract Documents.

E. Begin no fabrication or work which requires approved submittals until return of submittals by Engineer

1.06 SUBMISSION REQUIREMENTS

A. Make submittals in such sequence as to cause no delay in the work.

B. Number of submittals required:

1. Shop Drawings and Product Data: Submit six (6) copies.
2. Samples: Submit the quantity stated in each specification section.

C. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contract identification.
4. The names of:
   a. Contractor
   b. Supplier
   c. Manufacturer
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal specification numbers.
9. Identifications of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8-inch X 3.5-inch blank space for Contractor and Engineer stamps.
12. CONTRACTOR'S stamp intitialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the Work and of Contract Documents.

1.07 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals noted by the Engineer and resubmit unless otherwise noted.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those suggested by the Engineer.

C. Samples: Submit new samples as required for initial submittal.

1.08 ENGINEER'S DUTIES

A. Review submittals within 30 days or in accord with schedule.

B. Affix stamp and initials or signature, and indicate status of submittal.

C. Return submittals to Contractor for distribution, or resubmission.

D. Review initial submittals and one resubmittal. Resubmittals that cannot be approved will be returned. Additional resubmittals will be reviewed by the Engineer, and costs for time and materials for reviewing resubmittals will be back charged by the Engineer to the Contractor.

END OF SECTION

SECTION 01370
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit to the Engineer a Schedule of Values allocated to the various portions of the Work, within ten days after award of contract.

B. Upon the request of the Engineer, support the values with data which will substantiate their correctness.

C. The Schedule of Values, unless objected to by the Engineer, shall be used only as the basis for the Contractor's Applications for Payment.

D. Related Requirements in Other Parts of the Contract Documents.

1. Agreement
2. General Conditions
3. Supplementary Conditions

1.02 RELATED REQUIREMENTS

A. Section 01020: Allowances

B. Section 01152: Application for Payment

C. Section 01600: Material and Equipment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Type schedule on 8-1/2-inch X 11-inch white paper; Contractor's standard forms and automated printout will be considered for approval by Engineer upon Contractors request. Identify schedule with:

1. Title of Project, location and (City, County, Owner) Project Number.
2. Engineer and Engineer's Project number.
3. Name and Address of Contractor.
4. Date of Submission.

B. Schedule shall list the installed value of the component parts of the Work, in sufficient detail to serve as a basis for computing values for progress payments during construction.

C. Follow the table of contents of these Specifications as the format for listing component items.

1. Identify each line item with the number and title of the respective major section of the specifications.

D. For each major line item list sub-values of:

1. Major products or operations under the item.
2. Contract conditions, such as: bonds, insurance premiums, job mobilization, construction facilities and temporary controls.

E. For the various portions of the Work:

1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
2. For items on which progress payments will be requested for stored materials, break down the value into:
   a. The cost of the materials, delivered and unloaded, with taxes paid.
   b. The total installed value.

F. The sum of all values listed in the schedule shall equal the total Contract Sum.

1.04 SUBSCHEDULE OF UNIT MATERIAL VALUES

A. Submit a subschedule of unit costs and quantities for:

1. Products specified under a unit cost allowance in Section 01020.
2. Products on which progress payments will be requested for stored products.

B. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the line item it the Schedule of Values.

C. The unit quantity for bulk materials shall include an allowance for normal waste.

D. The unit values for the materials shall be broken down into:

1. Cost of the material, delivered and unloaded at the site, with taxes paid.
2. Installation costs, including Contractor's overhead and profit.

E. The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01380
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Employ competent photographer to take construction record photographs periodically during course of the Work.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work

B. Section 01020: Allowances.

C. Section 01152: Application for Payment.

D. Section 01700: Contract Closeout.

1.03 PHOTOGRAPHY REQUIRED

A. Provide photographs taken on cutoff date for each scheduled Application for Payment.

B. Views and Quantities Required:

1. At each specified time, photograph Project from twelve to twenty different views, as approved by Engineer.
2. Provide 8 x 10 inch prints of each view.

C. Negatives:

1. Submit to Engineer with prints.

1.04 COSTS OF PHOTOGRAPHY

A. Pay costs for specified photography and prints.

B. Parties requiring additional photography or prints will pay photographer directly.

PART 2 - PRODUCTS

2.01 PRINTS

A. Color:

1. Paper; Single weight, neutral black image tone, white base.
2. Finish: Smooth surface, glossy.

B. Identify each print on back, listing:

1. Name of Project.
2. Orientation of view.
3. Date and time or exposure.
4. Name and address of photographer.
5. Photographer's numbered identification of exposure.

PART 3 - EXECUTION

3.01 TECHNIQUE

A. Factual presentation

B. Correct exposure and focus.

1. High resolution and sharpness.
2. Maximum depth-of-field.
3. Minimum distortion.

3.02 VIEWS REQUIRED

A. Photograph from locations to adequately illustrate condition of construction and state of progress.

1. At successive periods of photography, take at least one photograph from the same overall view as previously.
2. Consult with engineer at each period of photography for instructions concerning views required.

3.03 DELIVERY OF PRINTS

A. Deliver prints to Engineer to accompany each Application for Payment.

END OF SECTION

SECTION 01410
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Owner will employ services of an Independent Testing Laboratory to perform specified testing.

1. Contractor shall cooperate with laboratory to facilitate the execution of its required services.

1.02 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and/or Engineer, provide access to Work or manufacturer's operations.

B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

D. Furnish copies of Products test reports as required.

E. Furnish incidental labor and facilities:

1. To provide access to Work to be tested.
2. To obtain and handle samples at the Project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. Notify the Engineer sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests:

When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.

G. Make arrangements with the Engineer and the laboratory and pay for additional samples and tests required for Contractor's convenience.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 PAYMENT

A. Testing of materials and products will be performed by an independent testing laboratory appointed and paid for by the Owner. Testing will be performed so as to least encumber the performance of Work.

B. The Owner will authorized the cost of one (1) series of tests only, on the area or item being evaluated. The Contractor shall pay for costs of additional testing as required due to improper performance of Work.

C. When work of this contract or portions of work are completed, notify the Engineer so that arrangements can be made with the laboratory to perform or witness the tests. Do not proceed with additional portions of Work until results have been verified.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain temporary utilities required for construction, remove on completion of Work.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01590: Field Offices an Sheds.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State and local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

A. Arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used.

B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting is available throughout the construction by the use of construction-type power cords.

C. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.

2.03 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.

B. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

C. Portable heaters shall be standard approved units complete with controls.

D. Pay all costs of installation, maintenance, operation and removal, and for fuel consumed.

2.04 TEMPORARY TELEPHONE SERVICE

A. Arrange with local telephone service company to provide direct line telephone service at the construction site. Service required:

1. One direct line instrument in Field Office of Contractor.
2. One direct line instrument in Field Office of Project Representative.
3. Other instruments at the option of the contractor, or as required by regulations.

B. Pay all costs for installation, maintenance and removal, and service charges for local calls. Toll charges shall be paid by the party who places the call.

2.05 TEMPORARY WATER

A. Provide water for construction and potable purposes; pay all costs for installation, maintenance and removal.

B. {Owner will provide all water for construction purposes for use by the Contractor at no expense.}

C. Make conservative use of water. Any negligence or wastefulness will be reason for waiving the provisions for free water.

D. All connections to hydrants to be made by Owner's personnel.

E. [Water for construction and non-potable purposes may be obtained from wells developed on site by Contractor.]

F. [Non-potable water for general construction purposes shall be clean, non-turbid, and non-saline; and acceptable to the Engineer.]

G. Water utilization for concrete plaster and mortar shall meet the respective requirements and standards set forth for water utilized in these construction materials.

H. The Owner will make water available at designated hydrants on the Owner's water system for use by the Contractor.

2.06 TEMPORARY SANITARY FACILITIES

A. Provide sanitary facilities in compliance with laws and regulations.

B. Service, clean and maintain facilities and enclosures.

C. Existing plumbing facilities shall not be used by construction personnel.

2.07 TEMPORARY ACCESS ROAD AND PARKING

A. Site Access Roads:

1. Construct new temporary access roads over designated easements from public thorough- fare to site entrance.

B. On-Site Roads and Parking Areas:

1. Locate roads, drives, walks and parking facilities to provide uninterrupted access to construction offices, mobilization, work, storage areas, and other areas required for execution of the contract.
2. Submit proposed location for Engineer's approval.
3. Provide access for emergency vehicles.
   a. Maintain driveways a minimum of 15 feet wide, between and around combustible materials in storage and mobilization areas.
4. Maintain traffic areas free as possible of excavated materials, construction equipment, products and debris.
5. Keep fire hydrants and water control valves free from obstruction and accessible for use.
6. Provide traffic control devices as required by governing authorities along established public thoroughfares which will be used as haul routes to site access.

2.08 TEMPORARY CONTROLS

A. Noise Control:

Not used.

B. Dust Control:

1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations, and provide positive means to prevent air-borne dust from dispersing into the atmosphere.

C. Water Control:

1. Provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties.
   a. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.
2. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
3. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

D. Pest Control:

Not used.

E. Rodent Control:

1. Provide rodent control as necessary to prevent infestation of construction or storage area.
   a. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.
   b. Should the use of rodenticides be considered necessary, submit an informational copy of the proposed program to Owner with a copy to Engineer. Clearly indicate:
      (1) The area or areas to be treated.
      (2) The rodenticides to be used, with a copy of the manufacturer's printed instructions.
      (3) The pollution preventative measures to be employed.
2. The use of any rodenticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

F. Debris Control:

1. Maintain all areas under Contractor's control free of extraneous debris.
2. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
   a. Provide acceptable containers for deposit of debris.
   b. Prohibit overloading of trucks to prevent spillages on access and haul routes.
      (1) Provide periodic inspection of traffic areas to enforce require- ments.
3. Schedule periodic collection and disposal of debris.
   a. Provide additional collections and disposals of debris whenever the periodic schedule is inadequate to prevent accumulation.

G. Pollution Control:

1. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
2. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.
   a. Excavate and dispose of any contaminated earth off-site, and replace with suit- able compacted fill and topsoil.
3. Take special measure to prevent harmful substances from entering public waters.
   a. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
4. Provide systems for control of atmospheric pollutants.
   a. Prevent toxic concentrations of chemicals.
   b. Prevent harmful dispersal of pollutants; into the atmosphere.

H. Erosion Control:

1. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   a. Hold the areas of bare soil exposed at one time to a minimum.
   b. Provide temporary control measures such as berms, dikes and drains.
2. Construct fills land waste areas by selective placement to eliminate surface silts or clays which will erode.
3. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with applicable requirements specified in Division 15 - Mechanical, and in Division 16 - Electrical.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore permanent facilities used for temporary services to specified condition.

1. Prior to final inspection, remove temporary lamps and install new lamps.

END OF SECTION

SECTION 01530
BARRIERS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain suitable barriers as required to prevent public entry, and to protect the Work, existing facilities, trees and plants from construction operations; remove when no longer needed, or at completion of Work.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01500: Construction Facilities and Temporary controls.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.02 FENCING

A. Minimum fence height six feet.

B. Open-Mesh Fence:

1. No 11 gauge, two inch mesh, 72 inches high galvanized chain link fabric, with extension arms and three strands of galvanized barbed wire.
2. Galvanized steel posts; 1-1/2 inch line posts and two inch corner posts.

2.03 BARRIERS

A. Materials are Contractor's option, as appropriate to serve required purpose.

PART 3 - EXECUTION

3.01 GENERAL

A. Install facilities of a neat and reasonably uniform appearance, structurally adequate for the required purposes.

B. Maintain barriers during entire construction period.

C. Relocate barriers as required by the progress of construction.

3.02 FENCES

A. Provide and maintain fences necessary to assure security of the site during construction to keep unauthorized people and animals form the site when construction is not in progress.

B. Gates shall have locks; and keys shall be furnished to the Owner.

C. Provide additional security measures as deemed necessary and approved by the Engineer.

3.03 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants at site which are designated to remain, and those adjacent to site.

B. Consult with the Engineer, and remove agreed-on roots and branches which interfere with construction.

1. Employ qualified tree surgeon to remove branches and treat cuts.

C. Provide temporary barriers to a height of six feet, around each, or around each group, of trees and plants.

D. Protect root zones of trees and plants:

1. Do not allow vehicular traffic or parking.
2. Do not store materials or products.
3. Prevent dumping of refuse or chemically injurious materials or liquids.
4. Prevent puddling or continuous running water.

E. Carefully supervise excavating, grading and filling, and other construction operations, to prevent damage.

F. Replace, or suitably repair, trees and plants designated to remain which are damaged or destroyed due to construction operations.

3.04 REMOVAL

A. Completely remove barricades, omit, when construction has progressed to the point that they are no longer needed and when approved by Engineer.

B. Repair damage caused by construction. Fill and grade areas of the site to the required evaluations, and clean up the area.

END OF SECTION

SECTION 01570
TRAFFIC CONTROL

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow around the construction area.

B. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

1.02 REFERENCES

Traffic regulation shall be in accordance with F.D.O.T. Roadway and Traffic Design Standards Series 600, 1991 Edition, Manual on Uniform Traffic Control Devices, latest Ed., and FDOT Standard Specifications, latest Ed.

1.03 TRAFFIC CONTROL PLAN

A. The Contractor is to prepare a traffic control plan and/or policy statement for each phase of construction. This plan is to be presented to the City Engineer at or before the pre-construction meeting.

B. All proposed traffic control plans and policy statements shall be complete and in compliance with Section 1.02.

1.04 TRAFFIC SIGNALS AND SIGNS

A. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under Contractor's control, or affected by Contractor's operations.

B. Provide traffic control and direction signs, post mounted, at all areas required by Section 1.02.

C. Traffic Signals - Construction requiring traffic signal modification shall be reported to the City Engineer at least 72 hours prior to the commencement of such activities. All excavation work within 30 feet of any traffic signal shall be reported to the City Engineer at least 72 hours prior to its commencement.

D. All existing traffic signs shall remain visible throughout construction activities unless superseded by required construction signing.

1.05 FLAGMEN

Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic (See Section 1.02).

1.06 FLARES AND LIGHTS

A. Provide lights as required by Section 1.02.

1. To clearly delineate traffic lanes and to guide traffic as required in Section 1.02
2. For use by flagmen in directing traffic.

B. Provide illumination of critical traffic and parking areas as required in Section 1.02.

1.07 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

B. Monitor parking of construction personnel's private vehicles.

1. Maintain free vehicular access to and through parking areas and driveways.
2. Prohibit parking on or adjacent to access roads, or in non-designated areas.

1.08 CONSTRUCTION VEHICLES

A. All slow moving construction vehicles shall have a slow moving sign visible from the rear of the vehicle.

B. All vehicles used for construction activities shall have audible back-up warning devices.

1.09 ROAD CLOSURES

A. No road shall be closed prior to receiving approval from the City Engineer.

B. At least seven days prior to a proposed road closure, the contractor shall submit to the City Engineer a complete traffic control plan. This plan shall include the following minimum information:

1. Sketch of work site and all area roads, streets and mark driveways.
2. Proposed detour route.

3. All necessary traffic control devices to be used.
4. Emergency contractor contact person name and phone to be available 24 hours a day.
5. Estimated times/dates of road closure.

C. The City Engineer shall have the authority to approve an emergency road closure.

PART 2 - PRODUCTS

A. All traffic control devices shall meet or exceed FDOT certification standards.

B. All traffic signs shall have high intensity face material.

PART 3 - EXECUTION

A. Upon notification by the owner either verbally or in writing, the contractor shall correct any noted deficiencies within one hour.

B. Inspection of all traffic control items shall be accomplished at least twice per day. One of these inspections shall be at the end of the work day or at night.

END OF SECTION

SECTION 01580
PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain one project identification sign.

B. Remove sign upon completion of construction.

C. Allow no other signs to be displayed without approval of Engineer.

1.02 PROJECT IDENTIFICATION SIGN

One painted sign of size, design, lettering, and construction as shown on page three of this section.

1. Locate as directed by Engineer.
2. Color as indicated.

1.03 QUALITY ASSURANCE

A. Sign Painter: Professional Experience in type of work required.

B. Finishes, Painting: Adequate to resist weathering and fading for scheduled construction period.

PART 2 - PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: May be new or used, wood or metal, in sound condition structurally adequate to work and suitable for specified finish.

B. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints.

C. Rough Hardware: Galvanized

D. Paint: Exterior quality.

1. Use Bulletin colors for graphics.

2. Colors for structure, framing, sign surfaces and graphics: As indicated.

PART 3 - EXECUTION

3.01 PROJECT IDENTIFICATION SIGN

A. Paint exposed surfaces of supports, framing and surface material; one coat of primer and one coat of exterior paint.

B. Paint graphics in styles, sizes and colors selected.

1. Lettering shall be as noted.
2. City Logo shall be yellow and blue.
3. Background shall be white.

3.02 SIGN LOCATION

Sign shall be located within the City right of way in an area approved by the Engineer.

3.03 MAINTENANCE

A. Maintain sign and supports in a neat, clean condition; repair damages to structure, framing or sign.

B. Relocate informational sign as required by progress of the work.

3.04 REMOVAL

A. Remove sign, framing, supports and foundations at completion of project or at direction of Engineer.

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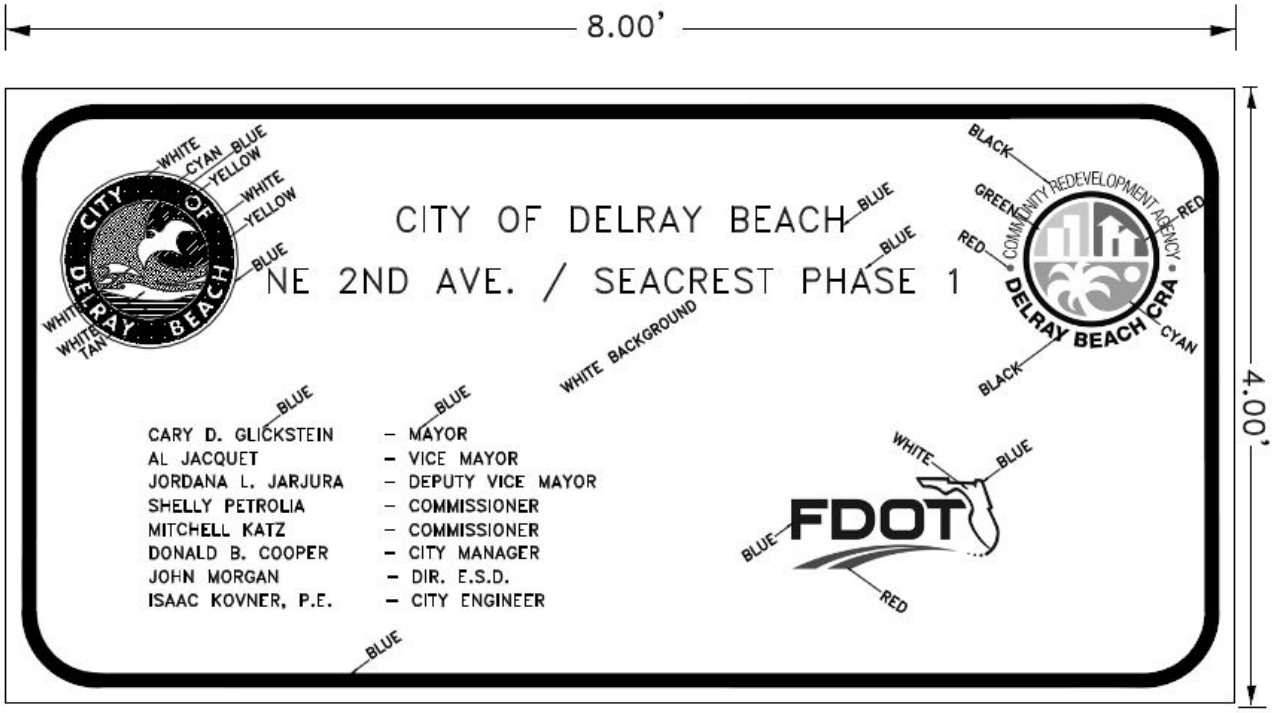


PROJECT IDENTIFICATION SIGN
01580-3

END OF SECTION

SECTION 01590
FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install and maintain temporary field offices during entire construction period.

B. Furnish, install and maintain storage and work sheds needed for construction.

C. At completion of work, remove field offices, sheds and contents.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01500: Construction Facilities and Temporary Controls.

1.03 OTHER REQUIREMENTS

A. Prior to installation of offices and sheds, consult with Engineer on location, access and related facilities.

1.04 REQUIREMENTS FOR FACILITIES

A. Construction:

1. Structurally sound, weathertight, with floors raised above ground.
2. Temperature transmission resistance: Compatible with occupancy and storage requirements.
3. At Contractor's option, portable or mobile buildings may be used.
   a. Mobile homes, when used, shall be modified for office use.
   b. Do not use mobile homes for living quarters.

B. Office for Engineer and Owner's Representative:

1. A separate space for sole use of designated occupants,with secure entrance doors and one key per occupant.
2. Area: 150 sq. ft. minimum, with minimum dimension eight feet.
3. Windows:
   a. Minimum: Three, with a minimum total area of 10 percent of floor area.

b. Operable sash and insect screens.
c. Locate to provide view of construction areas.

4. Furnishings:
   a. One standard size desk with three drawers, one per occupant.
   b. One drafting table: 39 in. X 72 in. and 36 in. high.
   c. One metal, double-door storage cabinet.
   d. One plan rack to hold a minimum of six racks of project drawings.
   e. Standard four-drawer legal-size metal filing cabinet with locks and keys.
   f. Six LF of bookshelves.
   g. One swivel arm chair.
   h. Two straight chairs.
   i. One drafting table stool.
   j. One waste basket per desk and table.
   k. One tackboard, 36 in. X 30 in.
5. Services
   a. Lighting: 50 foot-candles at desk top height.
   b. Automatic heating and mechanical cooling equipment to maintain comfort conditions.
   c. Minimum of four 110 volt duplex electric convenience outlets, at least one on each wall.
   d. Electric distribution panel: Two circuits minimum, 110 volt, 60 hertz service.
   e. Convenient access to drinking water and toilet facilities.
   f. Telephone: One direct line instrument.

C. Storage Sheds:

1. To requirements of various trades.
2. Dimensions: Adequate for storage and handling of products.
3. Ventilation: Comply with specified and code requirements for products stored.
4. Heating: Adequate to maintain temperatures specified in respective sections for the products stored.

1.05 USE OF EXISTING FACILITIES

A. Existing facilities at the site shall not be used for field offices or for storage.

1.06 USE OF PERMANENT FACILITIES

A. Permanent facilities shall not be used for field offices or for storage.

PART 2 - PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

A. May be new or used, but must be serviceable, adequate for required purpose, and must not violate applicable codes or regulations.

PART 3 - EXECUTION

3.01 PREPARATION

A. Fill and grade sites for temporary structures to provide surface drainage.

1. Dimensions: Adequate for storage and handling of products.

3.02 INSTALLATION

A. Construct temporary field office and storage sheds on proper foundations, provide connections for utility services.

1. Secure portable or mobile buildings when used.
2. Provide steps and landings at entrance doors.

B. Mount thermometer at convenient outside location, not in direct sunlight.

3.03 MAINTENANCE AND CLEANING

A. Provide periodic maintenance and cleaning for temporary structures, furnishings, equipment and services.

3.04 REMOVAL

A. Remove temporary field offices, contents and services at a time no longer needed.

B. Remove storage sheds when no longer needed.

C. Remove foundations and debris; grade site to required elevations and clean the areas.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Products.

B. Workmanship.

C. Manufacturer's Instructions.

D. Transportation and Handling.

E. Storage and Protection

F. Substitutions and Product Options.

1.02 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01020: Allowances.

C. Section 01090: Reference Standards.

D. Section 01340: Shop Drawings, Product Data and Samples.

E. Section 01630: Substitutions and Product Options.

F. Section 01700: Contract Closeout.

1.03 PRODUCTS

A. Products include material, equipment, and systems.

B. Comply with Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.

1.04 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances of specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by persons qualified to produce workmanship for specified quality.

C. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.05 MANUFACTURER'S INSTRUCTIONS

A. When work is specified to comply with manufacturer's instructions, submit copies as specified in Section 01340, and distribute copies to persons involved, and maintain one set in field office.

B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and instructions, consult with the Engineer.

1.06 TRANSPORTATION AND HANDLING

A. Provide equipment and personnel necessary to handle products, including those provided by Owner, by methods to prevent soiling or damage to products or packaging.

B. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.

C. Handle products by methods to prevent bending or overstressing.

D. Lift heavy components only at designated lifting points.

1.07 STORAGE AND PROTECTION

A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather-tight enclosures and maintain within temperature and humidity ranges required by manufacturer's instructions.

B. For exterior storage of fabricated Products, place on supports above ground. Cover Products subject to deterioration with impervious sheet covering; and provide ventilation to avoid condensation.

C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

D. Arrange storage to provide access for inspection. Periodically inspect to assure Products are undamaged, and are maintained under required conditions.

E. After installation, provide coverings to protect Products from damage from traffic and construction operations. Remove when no longer needed.

F. During such periods of time that are designated by the United States Weather Bureau as being a hurricane warning or alert, construction materials or equipment shall be secured against displacement by wind forces.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01630
SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

Furnish and install Products specified, under options and conditions for substitutions stated in this Section.

1.02 RELATED REQUIREMENTS

A. Information for Bidders and General Conditions.

B. Section 01020: Allowances.

C. Section 01340: Shop Drawings.

D. Section 01700: Contract Closeout.

1.03 PRODUCTS LIST

A. Within 30 days after award of Contract, submit to Engineer five copies of complete list of major Products which are proposed for installation.

B. Tabulate Products by specification section number and title.

C. For products specified only by reference standards, list for each such Product:

1. Name and address of manufacturer.
2. Trade Name.
3. Model or catalog designation.
4. Manufacturer's data:
   a. Reference standards.
   b. Performance test data.

1.04 CONTRACTOR'S OPTIONS

A. For Products specified only by reference standard, select product meeting that standard, by any manufacturer.

B. For products specified by naming several products or manufacturers, select any one or those products and manufacturers names which complies with Specifications.

C. For products specified by naming only one or more products or manufacturers and stating "or equal", submit a request as for substitutions, for any product or manufacturer which is not specifically named.

1.05 SUBSTITUTIONS

A. Within a period of 30 days after award of Contract, Engineer will consider formal requests from the Contractor for substitution of products in place of those specified:

After the end of that period, the request will be considered only in case of product unavailability or other conditions beyond the control of the Contractor.

B. Submit a separate request for each substitution. Support each request with:

1. Complete data substantiating compliance of the proposed substitution with requirements stated in the Contract Documents:
   a. Product identification, including manufacturer's name and address.
   b. Manufacturer's literature; identify:
      1) Product description.
      2) Reference standards.
      3) Performance and test data.
   c. Samples, as applicable.
   d. Name and address of similar projects on which product has been used, and the date of each installation
2. Itemized comparison of the proposed substitution with product specified; List significant variations.
3. Data relating to changes in the construction schedule.
4. Any effect of the substitution on separate contracts.
5. List of changes required in other work or products.
6. Accurate cost data comparing proposed substitution with product specified.
7. Designation of required license fees or royalties.
8. Designation of availability of maintenance services, and sources of replacement materials.

C. Substitutions will not be considered for acceptance when:

1. They are indicated or implied on Shop Drawings or product data submittals without a formal request from Contractor.
2. They are requested directly by a subcontractor or supplier.
3. No Data relating to changes in construction schedule.
4. Any effect of substitution on separate contracts.
5. List of changes required in other work or products.
6. Accurate cost data comparing proposed substitution with product specified.
7. Designation of required license fees or royalties.
8. Designation of availability of maintenance services, sources of replacement materials.

9. Acceptance will require substantial revision of Contract Documents.

D. Substitute products shall not be ordered or installed without written acceptance of Engineer.

E. Engineer will determine the acceptability of proposed substitutions.

1.06 CONTRACTOR'S REPRESENTATION

A. In making formal request for substitution Contractor represents that:

1. He has investigated proposed product and has determined that it is equal to or superior in all respects to that specified.
2. He will provide the same warranties or bonds for substitution as for product specified.
3. He will coordinate installation of accepted substitution into the Work, and will make such changes as may be required for the Work to be complete in all respects.
4. He waives claims for additional costs caused by substitution which may subsequently become apparent.
5. Cost data is complete and includes related costs under his Contract, but not:
   a. Costs under separate contracts.
   b. Engineer's costs of redesign or revision of Contract Documents.

1.07 ENGINEER DUTIES

A. Review Contractor's requests for substitutions with reasonable promptness.

B. Notify Contractor, in writing, of decision to accept or reject requested substitution.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Substantial Completion

B. Final inspection after completion

C. Final cleaning

D. Contractor's closeout submittals

E. Final adjustment of accounts

1.02 SUBSTANTIAL COMPLETION

A. When CONTRACTOR considers work has reached substantial completion, he shall submit to the ENGINEER the following:

1. Written notice that the work is substantially complete in accordance with Contract Documents.
2. A list of items yet to be completed or corrected and explanations thereof.

B. Within a reasonable time upon receipt of such notice, the ENGINEER will make an inspection, if necessary, to determine the status of completion.

C. Should the ENGINEER determine that the work is not substantially complete:

1. The ENGINEER will promptly notify the CONTRACTOR in writing, giving the reasons thereof.
2. CONTRACTOR shall remedy the deficiencies in the work and send a second written notice of Substantial Completion to the ENGINEER.
3. Upon receipt of the second notice, the ENGINEER will reinspect the Work.

D. When the ENGINEER finds that the Work is substantially complete he will issue a Certificate of Substantial Completion with a tentative list of items to be completed or corrected before final inspection.

1.03 FINAL INSPECTION AFTER COMPLETION

A. When CONTRACTOR considers the Work is complete with all minor deficiencies completed or corrected, he shall submit written certification that:

1. Contract Document requirements have been met.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. All minor deficiencies have been corrected or completed and the Work is ready for final inspection.
5. Project record documents are complete and submitted.

B. Within a reasonable time upon receipt of such certification, the ENGINEER will make an inspection to verify the status of completion.

C. Should the ENGINEER determine that the work is incomplete or defective:

1. The ENGINEER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.
2. CONTRACTOR shall remedy the deficiencies in the work and send a second written certification to the ENGINEER that the Work is complete.
3. Upon receipt of the second certification, the ENGINEER will reinspect the Work.

D. When the ENGINEER determines that the work is acceptable, under the Contract Documents, he shall request the CONTRACTOR to make closeout submittals.

1.04 FINAL CLEANING

A. Execute prior to final inspection.

B. Clean site; sweep paved areas, rake clean other surfaces.

C. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS

A. Project Record Documents

1. At Contract closeout, submit documents with transmittal letter containing date, Project title, CONTRACTOR'S name and address, list of documents, and signature of CONTRACTOR.

2. Drawings; Legibly marked to record actual construction:

a. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
b. Drawings shall be signed and sealed by a surveyor registered in the State of Florida.

3. Specifications and Addenda; Legibly mark each Section to record.
4. Changes made by Field Order or by Change Order.

B. Evidence of payment and Release of Liens.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to the Engineer.

B. Statement shall reflect all adjustments to the Contract Sum.

1. The original Contract sum.
2. Additions and deductions resulting from:
   a. Previous change orders or written amendment.
   b. Allowances
   c. Unit prices
   d. Deductions for uncorrected work.
   e. Penalties and bonuses
   f. Deductions for liquidated damages
   g. Other adjustments
3. Total Contract Sum as adjusted
4. Previous payments
5. Sum remaining due

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Maintain at the site of the OWNER a record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change Orders and other modifications to the Contract.
5. Approved Shop Drawings, Product Data and Samples.
6. Field Test Records.

1.02 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in CONTRACTOR's field office apart from documents used for construction.

1. Provide files and racks for storage of documents.
2. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with CSI format.

C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by OWNER's Representative.

1.04 MARKING DEVICES

Provide felt tip marking pens for recording information in the color code designated by OWNER's Representative.

1.05 RECORDING

A. Label each document, "PROJECT RECORD" in neat large printed letters, or by rubber stamp.

B. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

C. Drawings: Legibly mark to record actual construction (hard copy):

1. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

2. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structures.

3. Field changes of dimension and detail.

4. Changes made by Field Order or by Change Order.

5. Details not on original Contract Drawings.

D. Specifications and Addenda; legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each produce and item of equipment actually installed.

2. Changes made by Field Order or by Change Order.

1.06 AS-BUILT PLANS (RECORD DRAWINGS

A. The CONTRACTOR shall maintain full size (24"x36") field drawings to reflect the "as-built" items of work as the work progresses. Upon completion of the work, the CONTRACTOR shall prepare a record set of "as-built" drawings on full-size, reproducible material and an electronic file in ACAD 2000 Format or Latest Version. One set of full size design drawings on reproducible material will be furnished to the CONTRACTOR by the design ENGINEER at the current square foot price. An electronic file of the design drawings on a compact disk will be furnished to the CONTRACTOR by the design ENGINEER at no additional cost. No additional payment will be made for those "as-built" drawings.

B. The cost of maintaining record changes, and preparation of the Record Drawings shall be included in the unit prices bid for the affected items. Upon completion of the work the CONTRACTOR shall furnish the ENGINEER the reproducible "as-built" Drawings and the electronic files. The completed Record drawings shall be delivered to the Engineer at least 48 hours prior to final inspection of the work. **The Final inspection will not be conducted unless the Record Drawings are in the possession of the ENGINEER.**

C. The completed (or final) record drawings shall be certified by a Professional Land surveyor registered in the State of Florida. This certification shall consist of the surveyor's embossed seal bearing his registration number, the surveyor's signature and date on each sheet of the drawing set. In addition, the key sheet, cover sheet or first sheet of the plans set shall list the business address and telephone number of the surveyor.

D. Representative items of work that should be shown on the record drawings as verified, changed or added are shown below:

1. Plans:

   a. Structure types, location with grade of rim and flow-line elevations.
   b. Sewer type, length, size and elevations.
   c. Utility type, length, size and elevation in conflict structures.
   d. All maintenance access structures, valves and hydrants within right-of way.
   e. Spot (critical) elevations at plateaued intersections, P.C., P.T., midpoint of all intersections.
   f. Sewer laterals shall be stationed between maintenance access structures.

2. Pavement Marking and Signing Plans: Sign location where installed if different from plans.

3. Water and Sewer Plans: Location (horizontal and vertical) of all pipe lines, structures, fittings, valves and appurtenances and water /sanitary sewer pipe crossings.

E. The CONTRACTOR shall submit three sets of progress record drawings with each application for payment. These drawings shall accurately depict the work completed and for which payment is being requested.

F. As-built drawings shall include the following criteria at a minimum.

1. As-builts of water lines shall include the following information:

a. Top of pipe elevations and horizontal location every 100 lf.

b. Locations and elevations of all fittings including bends, tees, gate valves, double detector check valves, fire hydrant, etc.

c. All tie-ins to existing lines shall be as-built.

d. The ends of all water services at the buildings or homes shall be as-built or where the water service terminates.

2. As-builts of all gravity sanitary sewer lines include the following information:

a. Rims, inverts and length of piping between structures as well as slopes.

b. The stub ends of all sewer laterals shall be located and if there are any cleanouts installed on the sewer laterals then the invert elevation of these cleanouts need to be obtained.

c. Lift station as-builts shall consist of top of wet well elevation, invert elevation of the incoming line, bottom of the wet well and as-builts of the compound area.

3. Force main as-builts shall be prepared the same as the water line as-builts.

4. As-builts of all drainage lines shall include the following information:

a. Rims, inverts and length of piping between structures and weir elevations if applicable.

b. The size of the piping shall be verified by the survey crew at the time of as-built.

5. All rock as-builts for parking lot, roadways and swales areas shall consist of the following:

   a. Rock elevations at all high and low points, and at enough intermediate point's to confirm slope consistency and every 50' for roadways.

   b. Rock as-builts shall be taken at all locations where there is a finish grade elevation shown on the design plans.

   c. All catch basin and manhole rim elevations shall be shown.

   d. Elevations around island areas will also be required.

   e. As-builts shall be taken on all paved and unpaved swales prior to placement of asphalt and/or topsoil/sod, at enough intermediate points to confirm slope consistency and conformance to the plan details.

6. Lake and canal bank as-builts shall include a key sheet of the lake for the location of cross sections. Lake and canal bank cross sections shall be plotted at a minimum of every 100 lf, unless otherwise specified. As builts shall consist of the location and elevation of the top of bank, edge of water and the deep cut line, with the distance between each shown on the drawing.

7. Retention area as-built elevations shall be taken at the bottom of the retention area and at the top of bank. If there are contours indicated on the design plans, then they shall be as-built as well

8. If a change is made via field order or deviation to any structure, pipeline, etc., a new location shall be noted on the as-builts. The ENGINEER may request additional as-built information to verify horizontal or vertical locations.

1.07 SUBMITTAL

A. At Contract closeout, deliver Record Documents to OWNER's Representative, or presentation to the OWNER.

B. A complete set of "As-Built" Drawings shall be prepared and delivered to the OWNER's Representative for the OWNER. Work shall be performed by a Registered Professional Land Surveyor and shall include, but not be limited to the following:

1. Valve boxes, splice boxes, pull boxes, al underground utilities-waterlines, electrical runs, irrigation system, storm drainage pipe and structures, finished necessary grades, benches, curbs, fences walls signs, light fixtures and other items as necessary.

C. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.
2. Project title and number.
3. CONTRACTOR's name and address.
4. Title and number of each Record Document.
5. Signature of CONTRACTOR or his authorized representative.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION

SECTION 02010
SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.01 RESPONSIBILITY

A. Subsurface explorations have been made and copies of the results are included herein for reference. This information was obtained primarily for use in preparing the pavement base and subgrade design, the Contractor may draw his own conclusions therefrom. No responsibility is assumed by the Owner for subsoil quality or condition other than at the locations, and at the time the exploration was made. No claim for extra compensation or for extension of time will be allowed on account of subsurface conditions inconsistent with the data shown, except as may be provided elsewhere herein.

PART 2 - PRODUCTS

2.01 SOIL BORINGS

A. Copies of the following are included herein:

1. Soil boring data.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 02110
CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SCOPE

The work to be performed under this item shall consist of either the clearing of or the clearing and grubbing of the area along the alignment of construction as designated on the drawings.

A. Clearing - Where clearing only is required it shall consist of the cutting and removal of all trees, stumps, bush, logs, hedges, and the removal of all fences and other loose or projecting material from the designated area. The grubbing of stumps and roots will be required.

B. Clearing and Grubbing - Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which, in the opinion of ENGINEER, is unsuitable, including grubbing of stumps, roots, matter roots, foundations ad disposal from the project of all spoil materials resulting from clearing and grubbing by burning or otherwise.

1.02 REFERENCES

Florida Department of Transportation Standard Specifications for Road and Bridge construction (F.D.O.T.). latest edition.

PART 2 - MATERIALS

2.01 MATERIALS FOR REPLACEMENT

All materials required to be brought on to the site for filling of holes caused by grubbing or otherwise shall be consistent with materials of the surrounding area.

PART 3 - EXECUTION

3.01 SCHEDULE

CONTRACTOR shall schedule the clearing or clearing and grubbing work at a satisfactory distance in advance of the pipe laying operations.

3.02 SPOIL MATERIALS REMOVAL

All materials to be disposed of by removal from the site shall be disposed of by CONTRACTOR at the Contractor's expense. In no case shall any discarded materials be left in piles adjacent to or within the project limits. The manner and location of disposal of materials shall be subject to review by ENGINEER and shall not create an unsightly or objectionable view.

3.03 CLEARING

Clear the area of all objectionable materials. Trees unavoidably falling outside the specified limits must be cut up, removed, and disposed of in a satisfactory manner. Preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut to a height of not more than 12-inches above the ground. The grubbing of stumps and roots will be required.

Fences shall be removed and disposed of when directed by ENGINEER. Fence wire shall be neatly rolled and the wire and posts stored on the project if they are to be used again, or stored at a designated location if the fence is to remain the property of OWNER.

3.04 CLEARING AND GRUBBING

In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass and other unsatisfactory materials shall be removed.

All holes remaining after the grubbing operation in embankment areas shall have the sides broken down to flatten out the slopes, and shall be filled with acceptable material, moistened and properly compacted in layers to the density required. The same construction procedure shall be applied to all holes remaining after grubbing in excavation areas where the depth of holes exceeds the depth of the proposed excavation.

END OF SECTION

SECTION 02210
EXCAVATION AND SWALE GRADING

PART 1 - GENERAL

1.01 SCOPE

This item shall consist of the excavating, removing and satisfactory disposition of all materials required to construct the Project and the placement and shaping of required swales to be done in accordance with these Specifications and in conformity with the dimensions and typical sections, lines, and grades, shown on the Plans.

All suitable material taken from excavation shall be used in the formation of embankment, subgrade and for backfilling as indicated on the Plans or hauled off-site, or as directed by the ENGINEER. When the volume of excavation is not sufficient for construction of the fill to the grades indicated, the deficiency shall be supplied by the Contractor.

1.02 REFERENCES

Standards applicable to these specifications shall be:

A. Americans Association of State Highway and Transportation Officials (AASHTO).

B. Florida Department of Transportation (F.D.O.T.) Section 120 "Excavation and Embankment". from the Standards Specification for Road & Bridge Construction book

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION OF WORK

3.01 EXCAVATION

The rough excavation shall be carried to the necessary depth to obtain the specified depth of subgrade compaction shown on the Plans. Likewise, on embankments, the depth of subgrade compaction shall be as shown on the Plans.

Should the CONTRACTOR, through negligence or other fault, excavate below the designated lines, he shall replace the excavation with approved materials, in an approved manner and condition, at this own expense. The ENGINEER shall have complete control over the interpretation of the Plans and Specifications concerning the excavation, moving, placing and disposal of all material and shall determine the suitability of material to be placed in embankments. All material determined unsuitable shall be disposed of in waste areas or as directed. Topsoil shall not be used in fill or in subgrades but shall be handled and placed as directed.

The CONTRACTOR shall inform and satisfy himself as to the character, quantity, and distribution of all material to be excavated. No payment will be made for any excavated material which is used for purposes other than those designated. All spoil areas shall be leveled to a uniform line and section and shall present a neat appearance before project acceptance.

Those areas outside of the pavement areas in which the top layer of soil material becomes compacted, due to hauling or to any other activity of the CONTRACTOR, shall be scarified to a depth of 4-inches, as directed, to loosen and pulverize the soil.

If it is necessary to interrupt existing irrigation systems, sewers or under drainage conduits, utilities or similar underground structures, or parts thereof, the CONTRACTOR shall be reponsible for and shall take all necessary precautions to protect and preserve or provide temporary services. When such facilities are encountered, the CONTRACTOR shall, at his own expense, satisfactorily repair all damage to such facilities or structures which may result from any of his operations during the period of the contract.

3.02 SWALE EXCAVATION

Swale excavation shall consist of excavating for drainage swales such as intercepting, inlet or outlet or any other type as designed or shown on the Plans.

The work shall be performed in the proper sequence with the other construction. The location of all ditches shall be established on the ground. All satisfactory material shall be placed in fills; unsatisfactory material shall be placed inspoil areas or as directed. Waste or surplus material shall be disposed of as directed by the ENGINEER. All necessary handwork shall be performed to secure a finish true to line, elevation, and cross section, as designated.

Swales constructed on the project shall be maintained to the required cross section and shall be kept free from debris or obstructions until the project is accepted.

3.03 STRIPPING

All vegetation such as brush, heavy sods, heavy growth of grass, decayed vegetable matter, rubbish and any other unsuitable material within the area upon which embankment is to be placed shall be stripped or otherwise removed before the embankment is started, and in no case shall such objectionable material be allowed in or under the embankment.

END OF SECTION

SECTION 02211
SITE GRADING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Remove topsoil and stockpile on site for later use.

B. Excavate sub-soil and reform to grades, contours and levels.

C. Excavate or fill for roadways, walks, curbs, gutters, parking areas, landscaped areas and as shown on the Drawings.

1.02 RELATED WORK

A. Section 02110: Clearing and Grubbing.

B. Section 02210: Excavation and Swale Grading.

C. Section 02220: Trenching, Backfilling and Compacting.

D. Section 02260: Finish Grading.

E. Section 02513: Asphaltic Concrete Paving.

1.03 EXISTING CONDITIONS

A. Known underground, surface and aerial utility lines, and buried objects are based on best available data and indicated on the Drawings. Contractor shall verify all locations.

1.04 PROTECTION

A. Protect trees, shrubs and lawns and other features remaining as part of final landscaping.

B. Protect bench marks, and existing structures, fences, roads, sidewalks, paving and curbs against damage from equipment and vehicular traffic.

C. Protect aerial, surface, or underground utility lines or appurtenance which are to remain.

D. Repair any damage, at no cost to Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Excavated fill material: Soil free from roots, rocks larger than 3-inches, and building debris.

B. Additional fill material: Shall be approved by the Engineer.

PART 3 - EXECUTION

3.01 PREPARATION

A. Establish and identify required lines, levels, contours and datum.

B. Maintain bench marks, monuments, and other reference points. Re-establish if disturbed or destroyed, at no cost to Owner.

C. Before start of grading, establish the location and extent of utilities in the work areas. Notify utilities to remove and relocate lines which are in the way of construction.

D. Maintain, protect, reroute or extend as required existing utilities to remain which pass through the work area.

3.02 REMOVAL OF TOPSOIL

A. Topsoil of horticultural value shall be stripped from areas of construction under this contract and stockpiled in area designated by Engineer. Said material shall be stockpiled separately from fill material.

B. Do not permit topsoil to be mixed with subsoil

C. Do not strip topsoil when wet.

D. Do not drive heavy equipment over stockpiled topsoil.

3.03 ROUGH GRADING

A. Rough grade site to required levels, profiles, contours and elevations ready for finish grading and surface treatment. Maintain the following:

1. Sodded areas - 4 1/2-inches below finished grade elevation.
2. Seeded areas - 6-inches below finished grade.
3. Paved areas - 18-inches below finished grade elevations.
4. Shrub beds - 24-inches below finished grade elevations.
5. Flower beds - 18-inches below finished grade elevations.
6. Concrete sidewalks - 8-inches below finished grade elevations.

B. Pior to placing fill material over undisturbed subsoil, scarify surface to depth of 6-inches.

3.04 SURPLUS MATERIAL

A. Remove surplus materials from site.

B. Dispose of surplus material at no cost to Owner.

END OF SECTION

SECTION 02220
TRENCHING, BACKFILLING AND COMPACTING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Excavate for all underground piping.

B. Place and compact granular beds and fills over pipelines to rough grade elevations.

C. Dewater excavations as required.

1.02 RELATED WORK

A. Section 02661: Water Mains.

B. Section 02720: Storm Drainage System.

C. Section 02730: Sanitary Sewer Pipe.

1.03 SITE COMPACTION TESTING

A. Testing of compacted fill materials will be performed in accordance with F.D.O.T. and A.A.S.H.T.O. specifications.

B. If, during progress of Work, tests indicate that compacted materials do not meet specified requirements, remove defective work, replace and retest as directed by ENGINEER.

C. Ensure compacted fills are tested before proceeding with placement of surface materials.

1.04 PROTECTION

A. Protect trees, shrubs, lawn, areas to receive planting, rock outcropping and other features remaining as part of final landscaping.

B. Protect bench marks and existing structures, roads, sidewalks, paving and curbs against damage from vehicular or foot traffic. Install and maintain proper bridging, planking and cants to provide access to buildings.

C. Protect excavations by shoring, bracing, sheet piling underpinning, or by other methods, as required to prevent cave-ins or loose dirt from falling into excavations in accordance with Trench Safety Act.

D. Underpin or otherwise support adjacent structure(s) which may be damaged by excavation work. This includes other utility lines and pipe runs.

E. Notify ENGINEER of any unexpected sub-surface conditions. Discontinue work in the area until ENGINEER provides notification to resume work.

PART 2 - PRODUCTS

2.01 PRODUCTS

A. Bedding Materials: Pipe shall be placed on dry, undisturbed earth.

B. Selected Backfill: After pipe joints have been inspected and given preliminary approval, and sufficient time has elapsed for setting of joints if necessary, backfilling shall be performed, together with tamping until fill has progressed to an elevation at least one foot above the top of the pipe bell. During this initial stage of backfilling, approved granular materials or loose soil free from lumps, clods, or stones shall be deposited in layers approximately 6-inches thick and compacted by manually operated machine tampers actuated by compressed air, or other suitable means. Tampers and machines shall be suitable for the work, and subject to approval by ENGINEER.

C. Backfill Material: Excavated material, free from roots, rocks larger than 3½ inches in size and building debris.

D. Fill under landscaped areas: Free from alkali, salt, and petroleum products. Use sub-soil excavated from site only if conforming to specified requirements.

PART 3 - EXECUTION

3.01 PREPARATION AND LAYOUT

A. Establish extent of excavation by area and elevation. Designate and identify datum elevation.

B. Set required lines and levels.

C. Maintain bench marks, monuments and other reference points.

3.02 UTILITIES

A. Before starting excavation, establish the location and extent of underground utilities occurring in the work area.

B. Notify ENGINEER if utility lines which are in the way of excavation are uncovered.

C. Protect active utility services uncovered by excavation.

D. Remove abandoned utility service lines from areas of excavation. Cap, plug or seal such lines and identify at grade.

E. Accurately locate and record abandoned and active utility lines re-routed or extended on Project Record Documents.

3.03 TRENCHING

A. Ensure trenching does not interfere with normal 45 degree bearing splay of any foundation.

B. Excavate in accordance with lines and grades.

C. Cut trenches sufficiently wide to enable proper installation of pipe and to allow for inspection. Trim and shape trench bottom and leave free of irregularities, lumps and projections.

D. Do not disturb soil within branch spread of existing trees or shrubs that are to remain. If it is necessary to excavate through roots, perform work by hand and cut roots with a sharp axe.

E. When complete, request ENGINEER to inspect excavations. Correct unauthorized excavation as directed, at no cost to OWNER.

F. Remove excess or unsuitable excavated sub-soil from site.

3.04 DEWATERING

A. Keep trenches dry. Provide necessary equipment including pumps, piping and temporary drains.

B. Do not discharge drainage water into municipal sewers without municipal approval. Ensure water discharge does not contain silt held in suspension.

C. Direct surface drainage away from excavated areas.

D. Control the grading in and adjacent to excavations to prevent water running into excavated areas or onto adjacent properties or public thoroughfares.

E. Furnish and operate suitable pumps on a 24 hour basis to keep excavations free of water until piping has been placed and backfilling has been completed.

F. No water shall be allowed to rise over masonry or mortar until the concrete or mortar has set at least 24 hours.

3.05 BACKFILLING

A. Do not start backfilling until piping has been inspected.

B. Ensure trenches are free of building debris, wood, rocks over 3½ inches in diameter and water.

C. Backfill systematically and as early as possible to allow maximum time for natural settlement and compaction.

D. After backfill has reached a point one foot above the top of the pipe, a variation in the procedure as to manner of placing and amount of compaction to fill will be allowed, depending upon the location of the work and danger from subsequent settlement, as follows:

1. For backfilling in unimproved areas (along utility easements and in parkway strip beyond the edge of driveways and graveled parking areas), from an elevation of one foot above top of pipe to the surface of the ground, backfill may be deposited by equipment. Depositing in layers, or tamping will not be required. Sufficient surplus excavated material shall be neatly rounded over the trench, to compensate for settlement. All surplus excavated materials beyond that indicated above shall be disposed of by Contractor.
2. For backfilling beneath driveways and parking areas, alleys, and streets where non-rigid type surfacing is to be replaced. This shall also include dirt, gravel or asphalt driveways and alleys.
    a. The backfill material shall be carefully deposited in uniform layers not to exceed 12-inches in thickness and each layer shall be compacted to 98% of maximum density in accordance with AASHTO T-180 with manually operated machine tampers.
    b. In lieu of the foregoing compaction method, the backfill material and procedure used may be that as specified under Method 3, below.
    c. Berms: Every 200 feet per lift.
    d. Swales: For areas that have been built-up and a swale cut-in to every 200 feet; otherwise; density testing of swales cut-in to existing ground does not require density testing.
    e. The Contractor is to “map” all density test results on the Record Drawings on each day when field tests are performed. Contractor’s testing laboratory shall leave a copy of the day’s density testing results on site.

3. For backfilling across and beneath driveways, sidewalks, parking areas or streets where a rigid type paving is to be replaced (concrete and asphaltic concrete and brick surfaces).
   a. All backfill material shall be approved granular material of high weight and density. The material shall be carefully deposited in uniform layers not to exceed 12-inches thick (loose measure), and each layer shall be compacted by ramming or tamping with tools approved by ENGINEER in a manner that does not disturb the pipe. Where necessary, granular base material of the type and thickness specified shall be used for the last layer prior to surfacing.

END OF SECTION

SECTION 02235
LIMEROCK BASE, PRIMED

PART 1 - GENERAL

1.01 SCOPE

A. This item shall consist of the construction of a base course composed of limerock including the application of a bituminous prime coat. It shall be constructed on the prepared subgrade in accordance with these specification and shall conform to the dimensions, lines, grades and cross sections shown on the plans.

1.02 REFERENCES

Standards applicable to this Specification shall be:

A. American Association of State Highway and Transportation Officials Standard Specifications (AASHTO).

1. AASHTO T49-80 - Standard Method of Test for Penetration of Bituminous Materials.
2. AASHTO M81-75 (Latest Edition) - Standard Specification for Cut-Back Asphalt (Rapid-Curing Type).
3. AASHTO T180-74 (Latest Edition) - Standard Method of Tests for Moisture-Density Relations.

B. Florida Department of Transportation Standard Specifications (F.D.O.T.).

1. FDOT Section 200, Limerock Base Latest edition
2. FDOT Section 300, Prime and tack Latest edition
3. FDOT Section 911, Limerock Material for Base and Stabilized Base Latest edition

1.03 SUBMITTALS

A. The contractor will, at least ten days prior to start of work, submit in writing the source of all materials to be used.

B. The Contractor will, without additional compensation, submit such tests as may be required by the Engineer.

1.04 MEASUREMENT AND PAYMENT

A. Method of Measurement: The quantity to be paid for under this Section shall be the area, in square yards, of limerock base, primed, completed and accepted.

B. Basis of Payment: The quantity of limerock base primed, determined as provided above, shall be paid for at the contract unit price per square yard for Limerock Base primed, completed and accepted. Such price and payment shall be full compensation for all the work specified in this Section, including correcting all defective surface and deficient thickness.

PART 2 - MATERIALS

2.01 LIMEROCK

Except as might be specifically shown otherwise, all limerock material and the sources thereof shall be furnished by the Contractor. Any limerock material occurring in State furnished borrow areas shall not be used by the Contractor in constructing the base, unless permitted by the plans or other contract documents.

A. Composition - The minimum percentage of carbonates of calcium and magnesium in the limerock material shall be 70. The maximum percentage of water-sensitive clay mineral shall be 3%. Determination shall be at the option of the Engineer.

B. Liquid Limit and Plasticity Requirements

1. Material for Limerock Base: The liquid limit shall not exceed 35 and the material shall be non-plastic.
2. Material Used in Limerock Stabilized Base: The liquid limit shall not exceed 35 and the plastic index shall not exceed 10.

C. Mechanical Requirements

1. Deleterious Material - Limerock material shall not contain cherty or other extremely hard pieces, or lumps, balls or pockets of sand or clay size material in sufficient quantity as to be detrimental to the proper bonding, finishing, or strength of the limerock base.
2. Gradation and Size Requirements
   a) For Limerock Base - At least 97 percent (by weight of the material shall pass a 3-1/2 inch sieve and the material shall be graded uniformly down to dust. The fine material shall consist entirely of dust of fracture. All crushing or breaking-up which might be necessary in order to meet such size requirements shall be done before the material is placed on the road.

b) For Limerock Stabilized Base - For this use the limerock material shall meet the requirements of 911-5.21 except that 97 percent shall pass the 1-1/2 inch sieve.

D. Limerock Bearing Ratio Requirements - Limerock material used in construction of limerock base shall have an average LBR value of not less that 100. The average LBR value of material produced at a particular source shall be determined in accordance with an approved quality control procedure.

2.02 PRIME COAT MATERIAL (300-2 Latest Edition)

A. The material used for prime coat shall be cut-back Asphalt Grade RC-70 or RC-250 meeting the requirements of (FDOT 916-2) Emulsified Asphalt Grades SS-1 or CSS-1, SS-1H or CSS-1H diluted in equal proportion with water; Asphalt Emulsified Asphalt Grade AE-60, AE-90, AE-150 or AE-200 diluted at the ratio of 6 parts emulsified asphalt to 4 parts water; special MS-Emulsion diluted at the ratio of 6 parts emulsified asphalt to 4 parts water; Asphalt Emulsion Prime (AEP) meeting the requirements, Emulsion Prime (RS type) meeting the requirements of (FDOT 916-4), or other types and grades of bituminous material which may be called for in the plans or Special Provisions.

The Contractor may select any of the specified bituminous materials unless the plans or Special Provisions indicate the use of a specific material. Types and Grades of bituminous material other than those specified above may be allowed if it can be shown that the alternate material will properly perform the function of prime coat material.

B. Cover Material for Prime Coat - If an emulsified asphalt is used for prime coat, the Engineer may require that cover material be hot-asphalt coated (mix to contain from two to four percent asphalt-cement) if necessary to achieve a prime coat which will remain reasonably intact until the surface course is placed.

If material other than emulsified asphalt is used for the prime coat, the cover material shall be either sand (bare or hot-asphalt coated) or screenings, at the Contractor's option. The sand shall be nonplastic and free from any appreciable amount of silt, clay balls and root particles, and from any noticeable sticks, trash, vegetation or other organic matter. Screening shall be as specified in FDOT 902.5.

PART 3 - EXECUTION

3.01 TRANSPORTING LIMEROCK

The limerock shall be transported to the point where it is to be used, over rock previously placed if practicable, and dumped on the end of the preceding spread.

Hauling over the subgrade and dumping on the subgrade will be permitted when these operations will not be detrimental to the base as determined by the Engineer.

3.02 EQUIPMENT

A. Limerock Base - The rock shall be spread by mechanical rock spreaders, equipped with a device which strikes off the rock uniformly to laying thickness, and capable of producing an even distribution of the rock. For crossovers, intersections and ramp areas; for roadway widths of 20 feet or less; for the main roadway area when forms are used and for any other areas where the use of a mechanical spreader is not practicable; spreading may be done by bulldozers or blade graders.

B. Pressure Distributor - The pressure distributor shall be equipped with pneumatic tires having a sufficient width of rubber in contact with the road surface to avoid breaking the bond or forming a rut in the surface. The distance between the centers of openings of the outside nozzles of the spray bar shall be equal to the width of the application required, within an allowable variation two (2) inches.

The outside nozzle at each end of the spray bar shall have an area of opening not less than 25 percent nor more than 75 percent, in excess of the other nozzles. All other nozzles shall have uniform openings. When the application covers less than the full width, the normal opening of the end nozzle at the junction line may remain the same as those of the interior nozzles. less than the full width, the normal opening of the end nozzle at the junction line may remain the same as those of the interior nozzles.

3.03 SPREADING LIMEROCK

A. Method of Spreading - The limerock shall be spread uniformly with equipment as specified in 3.02 A. above. All segreated areas of fine or coarse rock shall be removed and replaced with properly graded rock.

B. Number of Courses - When the specified compacted thickness of the base is greater than six inches, the base; shall be constructed in two courses. The thickness of the first course shall be approximately one-half the total thickness of the finished base, or enough additional to bear the weight of the construction equipment without disturbing the subgrade.

3.04 COMPACTING AND FINISHING BASE

A. Single-Course Base - For single-course base, after the spreading is completed the entire surface shall be scarified and then shaped so as to produce the required grade and cross section after compaction.

B. Double-Course Base - For double-course base, the first course shall be cleaned of foreign material and bladed and brought to a surface cross section approximately parallel to that of the finished base. Prior to the spreading of any material for the upper course, the density tests for the lower course shall be made and the Engineer shall have determined that the required compaction has been obtained. After the spreading of the material for the final course is completed, its surface shall be finished and shaped so as to produce the required grade and cross section after compaction, and free of scabs and laminations.

C. Moisture Content - When the material does not have the proper moisture content to insure the required density, wetting or drying will be required. When water is added it shall be uniformly mixed-in by disking to the full depth of the course which is being compacted. Wetting or drying operations shall involve manipulation, as a unit, of the entire width and depth of the course which is being compacted.

D. Density Requirements - As soon as proper conditions of moisture are attained the material shall be compacted to a density of not less than 98 percent of maximum density as determined by AASHTO T 180. The minimum density which will be acceptable at any location outside the traveled roadway (such as intersections, crossovers, turnouts, etc) shall be 95 percent of such maximum. Limerock base for shoulder pavement shall be compacted to a density not less than 95 percent of the maximum density as determined under AASHTO T 180.

E. Density Test - At least three density determinations shall be made on each day's final compaction operations on each course, and the density determinations shall be made at more frequent intervals if deemed necessary by the Engineer.

During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density tests on the finished base.

F. Correction of Defects

1. Contamination of Base Material - If, at any time, the subgrade material should become mixed with the base course material, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.
2. Cracks and Checks - If cracks or checks appear in the base, either before or after priming, which, in the opinion of the Engineer, would impair the structural efficiency of the base, the Contractor shall remove the cracks or checks by rescarifying, reshaping, adding base material where necessary, and recompacting.

3.05 PRIMING

A. Preparation - The prime coat shall be applied only when the base meets the specified density requirements and the moisture content in the top half of the base does not exceed 90 percent of the optimum moisture of the base material. At the time of priming, the base shall be firm, unyielding and in such condition that no undue distortion will occur.

Before any bituminous material is applied, all loose material, dust, dirt, caked clay and other foreign material which might prevent proper bond with the existing surface shall be removed for the full width of the application. Particular care shall be taken in cleaning the outer edges of the strip to be treated, to insure that the prime or tack coat will adhere.

When the prime or tack coat is applied adjacent to curb and gutter, valley gutter or any other concrete surfaces, such concrete surfaces (except where they are to be covered with a bituminous wearing course) shall be covered with heavy paper, or otherwise protected while the prime or tack coat is being applied. Any bituminous material deposited on such concrete surfaces shall be removed.

The temperature of the prime material shall be between 100 degrees Fahrenheit and 150 degrees Fahrenheit. The actual temperature shall be that which will insure uniform distribution. The material shall be applied by means of a pressure distributor. The amount to be applied will be dependent on the character of the surface and shall be sufficient to coat the surface thoroughly and uniformly, with no excess.

B. Rate of Application - The rate of application shall be not less than 0.10 gallon per square yard, unless a lower rate is approved by the Engineer.

C. Sprinkling - If so required by the Engineer the base shall be lightly sprinkled with water and rolled with a traffic roller, in advance of the application of the prime.

D. Sanding - The primed base shall be covered by a light uniform application of cover material. If considered necessary for proper distribution of spread, the cover material shall be lightly dragged with a drag broom, after which it shall be rolled with a traffic roller, for at least ten passes over the entire area.

E. Sampling Device on Transport Tanks - All transport tanks delivering bituminous materials for use on the project shall be equipped with an approved spigot-type sampling device.

F. Temperature Sensing Device on Transport Tanks - All transport tanks delivering bituminous materials for use on the Department's projects shall be equipped with an approved dial type thermometer.

The thermometer shall have a temperature range from 50 degrees Fahrenheit to 500 degrees Fahrenheit in 25 degrees Fahrenheit increments with a minimum dial diameter of two inches.

The thermometer shall be located near the midpoint in length and within the middle third of the height of the tank and be enclosed in a well with a protective window or by other means as necessary to keep the instrument clean and in the proper working condition.

3.06 QUALITY CONTROL

A. Testing Surface - The finished surface of the base course shall be checked with a templet cut to the required crown and with a 15-foot straightedge laid parallel to the centerline of the road. All irregularities greater than 1/4 inch shall be corrected by scarifying and removing or adding rock as required, after which the entire area shall be recompacted as specified hereinbefore. In the testing of the surface, the measurements will not be taken in small holes caused by individual pieces of rock having been pulled out by the grader.

B. Thickness Requirements

1. Measurements - Thickness of base shall be measured at intervals of not more than 200 feet. Measurements shall be taken at various points on the cross section, through holes not less than three inches in diameter.
2. Areas Requiring Correction - Where the compacted base is deficient by more than 1/2 inch from the thickness called for in the plans, the Contractor shall correct such areas by scarifying and adding rock. The base shall be scarified and rock added for a distance of 100 feet in each direction from the edge of the deficient area. The affected areas shall then be brought to the required state of compaction and to the required thickness and cross section.
3. Deficient Areas Left in Place - As an exception to the requirement for correcting areas of base which show a thickness deficiency exceeding the allowable 1/2 inch, if so approved in writing by the Engineer. Any of such areas in which the extent of the deficiency might be considered as not sufficient to seriously impair the required strength of the base may be left in place. No payment, however, will be made for such deficient areas left in place and not corrected.

3.07 MAINTENANCE

The Contractor will be responsible for assuring that the true crown and templet are maintained, with no rutting or other distortion, and that the base meets all the requirements, at the time the surface course is applied.

END OF SECTION

SECTION 02260
FINISH GRADING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall, under this Section, supply, place, compact and roll finish grade materials prior to landscaping work.

B. Finish grade sub-soil.

C. Cut out areas to receive stabilizing base course materials for paving and sidewalks.

D. Place, finish grade and compact topsoil.

1.02 RELATED WORK

A. Section 02210: Excavation and Swale Grading.

B. Section 02211: Site Grading.

C. Section 02220: Trenching, Backfilling and Compacting.

D. Section 02934: Sodding.

1.03 PROTECTION

The Contractor shall prevent damage to existing fencing, trees, landscaping, natural features, bench marks, pavement, utility lines, and sprinkler system. Correct damage at no cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

Topsoil shall be friable loam free from subsoil, roots, grass, excessive amount of weeds, stones and foreign matter; acidity range (ph) of 5.5 to 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter. (Use topsoil stockpiled on site if conforming to these requirements, or as directed by the Engineer.)

PART 3 - EXECUTION

3.01 SUB-SOIL PREPARATION

A. Rough grade sub-soil systematically to allow for a maximum amount of natural settlement and compaction. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, etc., in excess of 2 inches in size. Remove sub-soil which has been contaminated with petroleum products.

B. Cut out areas, to sub-grade elevation, which are to receive stabilizing base for paving and sidewalks.

C. Bring sub-soil to required levels, profiles and contours. Make changes in grade gradual. Blend slopes in to level areas.

D. Slope grade away from building minimum 4 inches in 10 feet (unless indicated otherwise on Drawings).

3.02 PLACING TOPSOIL

A. Place topsoil in area where seeding, sodding and planting is to be performed. Place to the following minimum depths, up to finished grade elevations:

1. 6-inches for seeded areas.
2. 4 1/2-inches for sodded areas.
3. 24-inches for shrub beds.
4. 18-inches for flower beds.

B. Use topsoil in relatively dry state. Place during dry weather.

C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of sub-grades.

D. Remove stones, roots, grass, weeds, debris and other foreign material while spreading.

E. Manually spread topsoil around trees, plants, buildings and other structures to prevent damage which may be caused by grading equipment.

F. Lightly compact placed topsoil.

3.03 SURPLUS MATERIAL

A. Remove surplus sub-soil and topsoil from site.

B. Leave stockpile areas and entire job site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 02511
CONCRETE SIDEWALKS

PART 1 - GENERAL

1.01 SCOPE

A. The work specified in this section consists of the construction of concrete sidewalks, in accordance with these specifications, and in conformity with the lines, grades, dimensions and notes shown on the plans.

1.02 REFERENCES

A. City of Delray Beach Standards RT 5.1.

B. FDOT Satandard Specifications for Road and Bridge Construction, latest edition

PART 2 - PRODUCTS

2.01 MATERIALS

A. The concrete mix shall produce standard wieight concrete with the following properties to be verified by the use of the appropriate listed test methods.

1. Compressive strength: 3,000 psi at 28 days - tested according to ASTM designation C31 (AASHTO T23)
2. Slump Range: 2-4 inches - tested according according to ASTM designation C143 (AASHTO T119)

B. Joint materials shall be in accordance with FDOT Specification Section 932.

2.02 FORMS

A. Forms for this work shall be made of either wood or metal and shall have a depth equal to the plan dimensions for the depth of concrete being deposited against them. They shall be straight, fee from warp or bends, and of sufficient strength, when staked, to resist the pressure of the concrete without deviation from line and grade. Forms shall be cleaned each time they are used and shall be oiled or saturated with water prior to placing the concrete.

PART 3 - EXECUTION

3.01 SUB-GRADE

A. Excavation shall be made to the required depth, and the sub-grade or base upon which the sidewalk is to be set shall be compacted to a firm, even surface, true to grade and cross-section, by means of watering, rolling or tamping. The sub-grade For sidewalk to be used as driveway pavement shall be compacted as directed by the City Engineer. The sub-grade shall be moist at the time the concrete is placed.

3.02 JOINTS

A. Expansion Joints between the sidewalk and the curb or driveway or at fixed objects and sidewalk intersections shall be 1/2 inch joints, formed with a preformed joint filler.

B. Preformed Filler shall meet the requirements of AASHTO M-153 or M-213, or cellulose fiber types meeting all the requirements of AASHTO M-213 except the asphalt content are acceptable provided they contain minimums of 0.2 percent copper pentachlorophenate as a preservative and 1.0 percent waterproofing wax. For AASHTO M-153, unless a particular type is specified, either type I, type II, or type III may be used

C. Contraction Joints may be of the open type, or may be sawed.

1. Open type contraction joints shall be formed by staking a metal bulkhead in place and depositing the concrete on both sides. After the concrete has set sufficiently to preserve the width and shape of the joint, the bulkhead shall be removed. After the sidewalk has been finished over the joint, the slot shall be edged with a tool having a 1/2" radius.
2. If the Contractor elects to saw the contraction joints, a slot approximately 3/16" wide and not less than 1-1/2" deep shall be cut with a concrete saw after the concrete has set and within the following periods of time: Joints at not more than 30' intervals - 12 hrs after finishing, and remaining joints - within 96 hrs after finishing.

3.03 PLACING

A. The concrete shall be placed in the forms to the required depth, and shall be tamped and spaded until mortar entirely covers its surface.

3.04 FINISHING

A. SCREEDING: All surplus water, laitance and inert material shall be worked off the surface of the concrete with a ten (10) foot straight edge, or by some other method equally as satisfactory and so approved by the City Engineer.

B. FLOATING; SURFACE REQUIREMENTS: The concrete shall be given a wooden float finish. The surface variations shall not be more than three-sixteenths (3/16) inch under a ten (10) foot straight edge, nor more than one-eighth (1/8) inch on a five (5) foot transverse section. The edge of the sidewalk shall be carefully finished with an edging tool having a radius of one-half (1/2) inch.

3.06 THICKNESS

Concrete sidewalks shall be four (4) inches thick except at driveways where sidewalks shall be six (6) inches thick.

END OF SECTION

SECTION 02512
CONCRETE SIDEWALK RESTORATION

PART 1 - GENERAL

1.01 SCOPE

The work to be performed under this item shall include the selling and delivering and the installing of concrete sidewalk which have been removed and/or damaged during the course of construction of the work performed under this Contract. The sidewalk shall be replaced to the same width as the original sidewalk.

1.02 REFERENCES

Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction 1986 Section 345 "Portland Cement Concrete".

PART 2 - MATERIALS

2.01 ACCEPTABLE MATERIALS

A. The concrete mix shall produce standard weight concrete with the following properties to be verified by the use of the appropriate listed test methods.

1. Compressive strength: 3,000 psi at 28 days - tested according to ASTM designation C31 (AASHTO T23)
2. Slump Range: 2-4 inches - tested according to ASTM designation C143 (AASHTO T119)

B. Joint materials shall be in accordance with FDOT Specification Section 932.

PART 3 - EXECUTION

All material, labor, forms, tools and equipment for restoration of the sidewalk shall be supplied by the Contractor. All disturbed sidewalk shall be replaced with 4-inch thick 3,000 psi concrete (6-inches thick at driveways) to the widths required. The sidewalk finish shall match as near as possible the original finish. Broken or cracked sidewalk shall be removed and disposed of as directed by the Engineer.

END OF SECTION

SECTION 02513
ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Prepare sub-grade to receive base course.

B. Place stabilizing base courses, work and compact.

C. Prime base course, place asphalt pavement.

1.02 RELATED WORK

A. Section 01410: Testing Laboratory Services.

B. Section 02211: Site Grading.

C. Section 02580: Pavement Marking.

1.03 REFERENCE STANDARDS

A. ASTM D1557 - Tests for Moisture - Density Relationship of Soils using 10 lb. Rammer in 18 inch Drop.

B. AASHTO M-81 - Penetration Graded Asphalt Cement.

C. AASHTO M-140 - Emulsified Asphalt.

D. FDOT Standard Specification for Road & Bridge Construction - Section 200 - Limerock Base

E. FDOT Standard Specification for Road and Bridge Construction - Section 913 - Shell Base.

F. FDOT Standard Specification for Road and Bridge Construction - Section 913 - Shell Stabilized Base.

G. FDOT Standard Specification for Road and Bridge Construction - Section 330 - Hot Bituminous Mixtures General Construction Requirements.

H. FDOT Standard Specification for Road and Bridge Construction - Section 916-1 - Asphalt Cement.

1.04 TESTING AND INSPECTION

A. Testing and inspection of asphalt pavement mixes and testing of placed stabilizing base course and asphalt pavement will be performed by an independent testing laboratory, in accordance with Section 01410-Testing Lab Services, and Section 01020-Allowances. Testing and inspection will be performed so as to minimize disruption to work.

B. Allow testing laboratory access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphalt concrete mix.

C. When and if required, the testing laboratory will perform laboratory tests on proposed asphalt pavement mixes to determine conformity with requirements.

D. The testing laboratory will perform one series of compaction tests for stabilizing base course and for asphalt pavement. The contractor shall pay for costs of additional testing as required due to improper performance of work.

E. When stabilizing base course or portion thereof has been placed and compacted in accordance with requirements, notify the testing laboratory to perform density and bearing value tests. Do not place asphalt pavement until results have been verified and base course installation approved.

F. If compaction tests indicate that stabilizing base course or asphalt paving do not meet specified requirements, remove defective work, replace and retest at Contractor's expense.

PART 2 - MATERIALS

2.01 LIMEROCK

A. Composition - The minimum percentage of carbonates of calcium and magnesium in the limerock material shall be 70. The maximum percentage of water-sensitive clay mineral shall be 3 percent. Limerock material shall not contain cherty or other extremely hard pieces, or lumps, balls or pockets of sand or clay size material in sufficient quantity as to be detrimental to the proper bonding, finishing, or strength of the limerock base.

B. Gradation and Size Requirements - At least 97 percent (by weight of the material shall pass a 3½ inch sieve and the material shall be graded uniformly down to dust.

The fine material shall consist entirely of dust of fracture. All crushing or breaking-up which might be necessary in order to meet such size requirements shall be done before the material is placed on the road.

C. Limerock Bearing Requirements - Limerock material used in construction of limerock base shall have an average LBR value of not less than 100. The average LBR value of material produced at a particular source shall be determined in accordance with an approved quality control procedure.

2.02 CRUSHED CONCRETE

A. Composition - The minimum percentage of carbonates of calcium and magnesium in the material shall be 70. All foreign material such as metal fragments, organic matter, etc. shall be removed from the material before delivery to the job site.

B. Gradation - 100 percent (by weight) of the material shall pass a 3 inch sieve, with 40 percent to 70 percent passing the number 10 sieve. Not more than 20 percent, by dry weight, of the material shall pass the 200 sieve by washing. all crushing or breaking up which might be necessary in order to meet such size requirements shall be done before the material is placed on the road.

C. Bearing Requirements - The Crushed Concrete Base shall have an average Limerock Bearing Ration (LBR) of not less than 100. The average LBR value of material produced at a particular source shall be determined in accordance with an approved quality control procedure.

D. Crushed Concrete may be substituted for Limerock as base material by adding 2 inches to the specified thickness.

2.03 PRIME COAT

A. Prime coat shall be one of the following:

1. Cutback Asphalt, Grade RC-70 or RC-250 shall meet the requirements of AASHTO Specification M-81.
2. Emulsified Asphalt Grade SS-1 or SS1H shall meet the requirements of ASSHTO Specifications M-140 and/or M-280.

2.04 TACK COAT

A. Tack coat shall be one of the following:

1. Asphalt Cement, Penetration Grade 85-100 shall meet the requirements of AASHTO Specification M-20.
2. Emulsified Asphalt, Grade RS-2 shall meet the requirements of AASHTO Specification M-140.

2.05 ASPHALTIC CONCRETE

A. Asphaltic concrete surface course - Type S-III asphaltic concrete wearing surface, 1½ inches in compacted thickness or as indicated on the Drawings, in accordance with Sections 330-10 Compacting Mixture and 331 Type S-III Asphaltic Concrete of aforesaid DOT Standard Specification.

PART 3 - EXECUTION

3.01 PREPARATION

A. Subgrade shall be stabilized per Section 160 - Stabilizing, of the FDOT Standard Specifications for Road and Bridge Construction.

B. Bearing Value Requirements for subgrade stabilization

1. Limerock Bearing Ratio - Minimum LBR 40 under paved and curbed areas, and minimum LBR 30 in shoulder and swale areas.
2. Florida Bearing Value - Minimum FBV 75 pounds per square inch (psi) under paved and curbed areas, and minimum FBV 50 psi in shoulder and swale areas.

3.02 TRANSPORTING BASE COURSES

The limerock shall be transported to the point where it is to be used, over rock previously placed if practicable, and dumped on the end of the preceding spread. Hauling over the subgrade and dumping on the subgrade will be permitted when these operations will not be detrimental to the base as determined by the Engineer.

3.03 EQUIPMENT

A. Base Course - The rock shall be spread by mechanical rock spreaders, equipped with a device which strikes off the rock uniformly to laying thickness, and capable of producing an even distribution of the rock.

B. Pressure Distributor - The pressure distributor shall be equipped with pneumatic tires having a sufficient width of rubber in contact with the road surface to avoid breaking the bond or forming a rut in the surface. The distance between the centers of openings of the outside nozzles of the spray bar shall be equal to the width of the application required, within an allowable variation two (2) inches.

3.04 SPREADING BASE COURSE

A. Method of Spreading - The limerock shall be spread uniformly with equipment as specified in 3.02 above. All segregated areas of fine or coarse rock shall be removed and replaced with properly graded rock.

B. Number of Courses - When the specified compacted thickness of the base is greater than six inches, the base shall be constructed in two courses. The thickness of the first course shall be approximately one-half the total thickness of the finished base, or enough additional to bear the weight of the construction equipment without disturbing the subgrade.

3.05 COMPACTING AND FINISHING BASE

A. Dynamic Compactor with vibratory rollers shall not be used on this project and shall not be permitted at the job site. The contractor is responsible for all damages caused by compaction operations.

B. Single-Course Base - For single-course base, after the spreading is completed the entire surface shall be scarified and then shaped so as to produce the required grade and cross section after compaction.

C. Double-Course Base - For double-course base, the first course shall be cleaned of foreign material and bladed and brought to a surface cross section approximately parallel to that of the finished base. Prior to the spreading of any material for the upper course, the density tests for the lower course shall be made and the Engineer shall have determined that the required compaction has been obtained. After the spreading of the material for the final course is completed, its surface shall be finished and shaped so as to produce the required grade and cross section after compaction, and free of scabs and laminations.

D. Moisture Content - When the material does not have the proper moisture content to insure the required density, wetting or drying will be required. When water is added it shall be uniformly mixed-in by disking to the full depth of the course which is being compacted. Wetting or drying operations shall involve manipulation, as a unit, of the entire width and depth of the course which is being compacted.

E. Density Requirements - As soon as proper conditions of moisture are attained the material shall be compacted to a density of not less than 98 percent of maximum density as determined by AASHTO T-180. The minimum density which will be acceptable at any location outside the traveled roadway.

F. Density Test - At least three density determinations shall be made on each day's final compaction operations on each course, and the density determinations shall be made at more frequent intervals if deemed necessary by the Engineer.
During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density tests on the finished base.

G. Correction of Defects:

1. Contamination of Base Material - If, at any time, the subgrade material should become mixed with the base course material, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material, which shall be shaped and compacted as specified above.
2. Cracks and Checks - If cracks or checks appear in the base, either before or after priming, which, in the opinion of the Engineer, would impair the structural efficiency of the base, the Contractor shall remove the cracks or checks by rescarifying, reshaping, adding base material where necessary, and recompacting.

H. Surface Testing - The finished surface of the base course shall be checked with a templet cut to the required crown and with a 15 foot straightedge laid parallel to the center line of the road. All irregularities greater than ¼ inch shall be corrected by scarifying and removing or adding base course material as required, after which the entire area shall be recompacted.

3.06 PRIMING

A. Preparation - The prime coat shall be applied only when the base meets the specified density requirements and the moisture content in the top half of the base does not exceed 90 percent of the optimum moisture of the base material. At the time of priming, the base shall be firm, unyielding and in such condition that no undue distortion will occur.

Before any bituminous material is applied, all loose material, dust, dirt, caked clay and other foreign material which might prevent proper bond with the existing surface shall be removed for the full width of the application. Particular care shall be taken in cleaning the outer edges of the strip to be treated, to insure that the prime or tack coat will adhere.

When the prime or tack coat is applied adjacent to curb and gutter, valley gutter or any other concrete surfaces, such concrete surfaces (except where they are to be covered with a bituminous wearing course) shall be covered with heavy paper, or otherwise protected while the prime or tack coat is being applied. Any bituminous material deposited on such concrete surfaces shall be removed.

The temperature of the prime material shall be between 100 degrees Fahrenheit and 150 degrees Fahrenheit. The actual temperature shall be that which will insure uniform distribution. The material shall be applied by means of a pressure distributor. The amount to be applied will be dependent on the character of the surface and shall be sufficient to coat the surface thoroughly and uniformly, with no excess.

B. Rate of Application - The rate of application shall be not less than 0.10 gallon per square yard, unless a lower rate is approved by the Engineer.

C. Sprinkling - If so required by the Engineer the base shall be lightly sprinkled with water and rolled with a traffic roller, in advance of the application of the prime.

D. Sanding - The primed base shall be covered by a light uniform application of cover material. If considered necessary for proper distribution of spread, the cover material shall be lightly dragged with a drag broom, after which it shall be rolled with a traffic roller.

E. Sampling Device on Transport Tanks - All transport tanks delivering bituminous materials for use on the project shall be equipped with an approved spigot-type sampling device.

F. Temperature Sensing Device on Transport Tanks - All transport tanks delivering bituminous materials shall be equipped with an approved dial type thermometer. The thermometer shall have a temperature range from 50 degrees Fahrenheit to 500 degrees Fahrenheit in 25 degrees Fahrenheit increments with a minimum dial diameter of two inches.

3.07 QUALITY CONTROL

A. Testing Surface - The finished surface of the base course shall be checked with a templet cut to the required crown and with a 15-foot straightedge laid parallel to the centerline of the road. All irregularities greater than ¼ inch shall be corrected by scarifying and removing or adding rock as required, after which the entire area shall be recompacted as specified hereinbefore. In the testing of the surface, the measurements will not be taken in small holes caused by individual pieces of rock having been pulled out by the grader.

B. Thickness Requirements:

1. Measurements - Thickness of base shall be measured at intervals of not more than 200 feet. Measurements shall be taken at various points on the cross section, through holes not less than three inches in diameter.
2. Areas Requiring Correction - Where the compacted base is deficient by more than ½ inch from the thickness called for in the plans, the Contractor shall correct such areas by scarifying and adding rock. The base shall be scarified

and rock added for a distance of 100 feet in each direction from the edge of the deficient area. The affected areas shall then be brought to the required state of compaction and to the required thickness and cross section.

3. Deficient Areas Left in Place - As an exception to the requirement for correcting areas of base which show a thickness deficiency exceeding the allowable ½ inch, the deficiency might be considered as not sufficient to seriously impair the required strength of the base and may be left in place. No payment, however, will be made for such deficient areas left in place and not corrected.

3.08 MAINTENANCE

The Contractor will be responsible for assuring that the true crown and templet are maintained, with no rutting or other distortion, and that the base meets all the requirements, at the time the surface course is applied.

3.09 PROTECTING ADJACENT WORK

Provide adequate protection for all adjacent construction, whatever it may be, against bituminous spraying. Spraying of bituminous material on work, other than base course, will not be accepted.

3.10 TRANSPORTATION OF THE ASPHALT

The surface course shall be transported in tight vehicles previously cleaned of all foreign material. The inside surface of the truck bodies shall be only thinly coated with soapy water or an approved emulsion containing not over 5 percent oil. Kerosine, gasoline or similar products shall not be used. After coating and before loading, the truck bodies shall be raised and drained of all excess liquids.

3.11 INSTALLATION OF FINAL ASPHALTIC CONCRETE SURFACE COURSE

The Contractor shall install Type S-III asphaltic concrete surface course over the entire surface in two (2) ¾ inch lifts.

Mechanical spreading and screeding equipment shall be of an approved type that is self-propelled and can be steered. It shall be equipped with a receiving and disbursing hopper and a mechanical screed or strike-off member capable of adjustment to regulate the depth of material being spread. Tandem Type 5 to 12 ton steel- wheeled rollers shall be used for sealing. Self- Propelled, pneumatic-tired traffic rollers equipped with at least 7b smooth tread, low pressure tires, having a total weight of 6 to 10 tons shall be used for final rolling.

3.12 FIELD QUALITY CONTROL

The final surface course of all pavements will be required to be checked by a rolling straightedge. The finished surface shall not vary more than 3/16 inch from the straightedge applied parallel to the centerline of the pavement. The straightedge shall have an effective length of 15 feet.

END OF SECTION

SECTION 02520
CONCRETE CURBS AND HEADERS

PART 1 - GENERAL

1.01 SCOPE

The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, appliances and materials and performing all operations in connection the construction of concrete curbs and headers, complete and in place, in strict accordance with these specifications and the applicable drawings and subject to the terms and conditions of this contract.

1.02 REFERENCES

Florida Department of Transportation Standard Specifications for Road and Bridge Construction, (latest edition)

PART 2 - PRODUCTS

2.01 MATERIALS

A. The concrete mix shall produce standard weight concrete with the following properties to be verified by the use of the appropriate listed test methods.

- *Compressive strength*: 3,000 psi at 28 days - tested according to ASTM designation C31 (AASHTO T23)
- *Slump Range*: 2-4 inches - tested according to ASTM designation C143 (AASHTO T119)

B. Joint materials shall be in accordance with FDOT Specification Section 932

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

Concrete curbs and headers shall be constructed of the type and in the locations as shown on the plans.

A. FORMS: Forms for this work shall be made of either wood or metal. They shall be straight, free from warp or bends, and of sufficient strength, when staked, to resist the pressure of the concrete without springing. If made of wood, they shall be of two (2)

inch surfaced plank; if made of metal, they shall be of approved section and shall have a flat surface on top.

B. CONSTRUCTION: Excavation shall be made to the required depth; and the sub-grade or base upon which the curb or header is placed shall be compacted to 98% AASHTO T-180.

The concrete shall be placed in the forms to the depth specified, and tamped and spaded to prevent honeycomb and until the top of the structure can be floated smooth and the edges rounded to the radius shown on the plans.

Contraction joints shall be placed at intervals of ten feet except where a lesser interval is required for closure, but no section shall be less than four feet in length.

Contraction joints shall be created while the concrete is still plastic by using a grooving tool or by inserting a premolded filler strip, or a groove may be saw cut into the concrete soon after it has hardened. Curb with irregular cracks due to late contraction joint construction will not be accepted.

Expansion joints shall be constructed at all radius points and at other locations indicated on the plans. They shall be located at intervals of 500 feet between other expansion joints, or ends of a run. The joint shall be 1/2 inch in width.

The forms shall be removed within twenty-four (24) hours after the concrete has been placed, and minor defects then filled with mortar composted of one (1) part of Portland Cement and two (2) parts of fine aggregate. Plastering shall not be permitted on the face of the curb; and all rejected curb, or header shall be removed and replaced without additional compensation. The curb top, face and/or header top shall be given a surface finish while the concrete is still green. A brush finish will be required unless noted otherwise; however, additional finishing may be required in areas considered too rough or with minor defects.

After the concrete has been rubbed smooth, it shall be rubbed again until a uniform color is produced, using a thin grout composed of one (1) part of Portland Cement and one (1) part of fine aggregate.

After concrete has set sufficiently, the spaces in front and back of the curb shall be refilled to the required elevation with suitable material, which shall be placed and thoroughly compacted in layers of not more than six (6) inches in thickness.

END OF SECTION

SECTION 02546
FINAL ASPHALTIC CONCRETE SURFACE COURSE

PART 1 - GENERAL

1.01 SCOPE

The work to be performed under this item shall include the selling, delivering and installing of final asphaltic concrete surface courses as herein specified.

1.02 REFERENCES

Standards applicable in this Specification shall be:

A. Florida Department of Transportation - Standard Specifications for Road and Bridge Construction (Latest Edition).

1. Section 300 - Prime and Tack Coats for Base Courses. Subsections (1, 2.3, 3, 4, 5, 7).
2. Section 320 - Hot Bituminous Mixtures - Plant, Methods and Equipment. Subsections (1, 2.1, 2.5 to 2.13, 3, 4, 5).
3. Section 330 - Hot Bituminous Mixtures - General Construction Requirements. Subsections (1, 3 to 13).
4. Section 334 - Type S-1 or SP-12.5, Asphaltic Concrete.

1.03 SUBMITTALS

A. Manufacturer's Data - Prior to fabrication or installation of the final asphaltic concrete surface course, the Contractor shall furnish to the Engineer, for review and approval the following:

1. Certification from the manufacturer that their plant meets the requirements of Section 320 above.
2. Formula for job mix.

PART 2 - MATERIALS

2.01 TACK COAT

Unless otherwise specified by the Engineer, the material used for the tack coat shall be Emulsified Asphalt, Grade RS-2, Section 300-2.3 F.D.O.T. Standard Specification for Road and Bridge Construction.

2.02 FINAL ASPHALTIC SURFACE COURSES

The material used shall be Type S-III or SP-9.5 asphaltic concrete conforming to Section 334 of the F.D.O.T. Standard Specifications for Road and Bridge Construction.

PART 3 - EXECUTION

3.01 CLEANING SURFACES

Prior to the laying of the surface courses, the surface of the pavement or base to be covered shall be cleaned of all loose and deleterious material by the use of power brooming or hand brooming where necessary. All such material shall be collected and disposed of by the Contractor.

3.02 PATCHING AND LEVELING COURSES

Where a surface course is to be constructed on an existing paved surface which is irregular, said surface shall be brought to proper grade and cross section by the application of patching or leveling courses.

3.03 APPLICATION OF TACK COAT

The material shall be heated to a suitable temperature and applied in a thin, uniform layer at a rate of between 0.02 and 0.08 gallons per square yard. The tack coat shall be applied sufficiently in advance of the surface course laying to permit drying but not so far in advance as to lose its adhesiveness as a result of being covered with dust. The tack coat shall be kept free from traffic until the surface course has been laid.

3.04 TRANSPORTATION OF THE ASPHALT

The surface course shall be transported in tight vehicles previously cleaned of all foreign material. The inside surface of the truck bodies shall be only thinly coated with soapy water or an approved emulsion containing not over 5% oil. Kerosine, gasoline or similar products shall not be used. After coating and before loading, the truck bodies shall be raised and drained of all excess liquids.

3.05 INSTALLATION OF FINAL ASPHALTIC CONCRETE SURFACE COURSE

Prior to final acceptance, or as directed by the Engineer, the Contractor shall install a 1-inch layer of Type S-1 Final Asphaltic Concrete Surface course over the entire street width as directed by the Engineer. A leveling course as indicated

on the storm drainage plan sheets shall be placed prior to the final asphaltic concrete surface course under this item. All other placement of pavement shall be as shown on the "Restoration Detail" for non state-owned public pavement.

Mechanical spreading and screeding equipment shall be of an approved type that is self-propelled and can be steered. It shall be equipped with a receiving and disbursing hopper and a mechanical screed or strike-off member capable of adjustment to regulate the depth of material being spread. Tandem Type 5 to 12 ton steel- wheeled rollers shall be used for sealing. Self- Propelled, pneumatic-tired traffic rollers equipped with at least 7b smooth tread, low pressure tires, having a total weight of 6 to 10 tons shall be used for final rolling.

3.06 FIELD QUALITY CONTROL

The final surface course of all pavements will be required to be checked by a rolling straightedge. The finished surface shall not vary more than 3/16 inch from the straightedge applied parallel to the centerline of the pavement. The straightedge shall have an effective length of 15 feet.

END OF SECTION

SECTION 02570
MILLING OF EXISTING ASPHALT PAVEMENT

PART 1 - GENERAL

1.10 SCOPE

The work specified in this Section consists of removing existing asphaltic concrete pavement by milling to improve the rideability of the finished pavement, to lower the finished grade adjacent to existing curb prior to resurfacing, or to completely remove existing pavement.

When milling to improve rideability, an average depth of cut will be specified in the plans.

Unless otherwise specified, the milled material becomes the property of the Contractor.

1.02 REFERENCES

Florida Department of Transportation - Standard Specification for Road and Bridge Construction (Latest Edition)

PART 2 - EQUIPMENT

2.01 MILLING MACHINE

The milling machine shall be capable of maintaining a depth of cut and cross slope that will achieve the results specified in the plans and specifications. The overall length of the machine (out to out measurement excluding the conveyor) shall be a minimum of 18 feet. The minimum cutting width shall be six feet.

The milling machine shall be equipped with a built-in automatic grade control system that can control the transverse slope and the longitudinal profile to produce the specified results.

Any commercially manufactured milling machine meeting the above requirements will be approved to start the project. If it becomes evident after milling has started that the milling machine cannot consistently produce the specified results, the milling machine will be rejected for further use.

When milling to lower the grade adjacent to existing curb or other areas where it impractical to use the above described equipment, the use of a smaller milling machine will be permitted.

The milling machine shall be equipped with means to effectively limit the amount of dust escaping the removal operation. For complete pavement removal, the use of alternate

removal and crushing equipment, in lieu of the equipment specified above, may be approved by the Engineer.

PART 3 - EXECUTION

3.01 CONSTRUCTION

When milling to improve rideability, the existing pavement shall be removed to the average depth specified in the plans, in a manner that will restore the pavement surface to a uniform cross section and longitudinal profile. The Project Engineer may require the use of a stringline to ensure maintaining the proper alignment.

The contractor may elect to make multiple cuts to achieve the required pavement configuration or depth of cut.

The milling machine shall be operated to effectively minimize the amount of dust being emitted from the machine. Prewetting of the pavement may be required.

If traffic is to be maintained on the milled surface prior to the placement of the new asphaltic concrete, the pattern of striations shall be such as to produce an acceptable riding surface.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a power broom or other approved equipment to remove to the greatest extent practicable, fine material which will dust under traffic. This operation shall be conducted in a manner so as to minimize the potential for creation of a traffic hazard and to minimize air pollution.

Sweeping of the milled surface with a power broom will be required prior to placing asphaltic concrete.

In urban and other sensitive areas where dust would cause a serious problem, the Contractor shall use a street sweeper (using water) or other equipment capable of removing and controlling dust. Approval of the use of such equipment is contingent upon its demonstrated ability to do the work.

To prevent, to the greatest extent practicable, the infiltration of milled material into the storm sewer system when the milling operation is within the limits of and adjacent to a municipal curb and gutter or a closed drainage system, the sweeping operation shall be performed immediately after the milling operations or as directly by the Engineer.

END OF SECTION

SECTION 02574
PAVEMENT REMOVAL AND REPLACEMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Work included under this Section consists of cutting, removing, protecting and replacing existing pavements of the various types encountered, roadways, driveways, sidewalks, curb and combination curb and gutter.

B. Protection of Existing Improvements: The Contractor shall be responsible for the protection of all pavements, sidewalks and other improvements within the work area. All damage to such improvements, as a result of the Contractor's operations, beyond the limits of the work of pavement replacement as described herein, shall be repaired by the Contractor at his expense.

PART 2 - PRODUCTS

2.01 MATERIALS

Materials, including limerock, bituminous prime and tack coat, and asphaltic concrete for the above work shall meet the requirements established therefore by the FDOT Specifications.

1. Limerock shall be Miami or Ocala Limerock.
2. Bituminous prime coat material shall be cutback asphalt Grade RC-70.
3. Bituminous tack coat material shall be emulsified asphalt Grade RS-2.
4. Asphaltic concrete shall be Type S-III

PART 3 - EXECUTION

3.01 PREPARATION

Pedestrian or school crossings: Where the work crosses or interferes with school or pedestrian crossings, extreme care shall be taken by the contractor to insure the safety of school children or other pedestrians.

3.02 PERFORMANCE

A. Removals:

1. *Pavement Removal*: Where existing pavement is to be removed, the surfacing shall be mechanical saw cut prior to trench excavation, leaving a uniform and straight edge, with minimum disturbance to the remaining adjacent surfacing. The width of cut for this phase of existing pavement removal shall be minimal.
2. *Sidewalk, Drive, and Curb Removal*: Concrete sidewalks, curbs, combination curb and gutter, walks, drive ribbons, or driveways shall be removed by initially sawing the structure, with a suitable power saw, as specified above for pavement. When a formed joint in the concrete exists within 3 feet of the proposed saw cut and parallels the proposed saw cut, the removal line shall be extended to the formed joint. After sawing, the material shall be removed.

B. Restorations:

1. *General*: Street or roadway pavement cut and removed in connection with trench excavation shall be replaced or restored in equal or better condition than the original and as shown on the Drawings. The Drawings indicate minimum requirements.
2. *Pavement Restoration - Asphalt*:
   a. Limerock base course shall be compacted for its full thickness to not less than 98 percent of maximum density as determined by AASHTO T-180.
   b. Construction methods and equipment shall generally meet the requirements therefore as established in the FDOT Specifications, but shall be modified to meet the relatively narrow strip construction conditions. Any such modifications shall be approved by the Engineer prior to their use.
   c. Joints with existing surface and base shall be straight and neat. If necessary to obtain a straight net joint, the Contractor shall cut out sufficient existing material and replace it with new material.
   d. The upper surface of the completed base course shall be compacted to an elevation to permit the full depth of the surface course to be of the pavement surface. The completed surface shall match the line and grade of the existing surface. When pavement is removed to the edge of the roadway, the replaced base course shall extend not less than 6-inches beyond the edge of the surfacing constructed without deviating from the grade
3. *Driveway Restoration - Asphalt*: Driveway pavement with limerock base cut and removed in connection with trench excavation shall be replaced or restored as specified above for street or roadway pavement, except the new limerock base course shall equal the existing base course in thickness, except that in no case shall new driveway base course be less than 6-inches in

thickness. Muck or unsuitable material found under existing driveway construction will not be removed and replaced.

4. *Concrete, Sidewalk, Walkway, Driveway Ribbon and Curb Restoration*.
   a. Concrete sidewalks, walkways, driveways, driveway ribbons and curbs required to be removed for the installation of facilities under this Contract shall be restored. Class B concrete shall be used in all cases.
   b. Replaced portions of these items shall conform to the lines, grades and cross sections of the removed portions. Concrete sidewalks and walkways shall be of 4-inch thickness; concrete driveways and driveway ribbons shall be 6-inch thickness. Replaced concrete curb and/or gutter shall joint neatly to the remaining section.
5. *Pavement Restoration - Concrete*: Rigid pavement shall be replaced in kind with Class B concrete, using high early strength cement.

END OF SECTION

SECTION 02580
PAVEMENT MARKINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work included in this Section consists of applying pavement markings as required to restore disturbed pavement areas. Work shall adhere to all City and FDOT standards.

1.02 RELATED REFERENCES

A. All markings shall conform to the requirements of the Manual of Uniform Traffic Control Devices, and FDOT Roadway and Traffic Design Standards.

B. Thermoplastic shall conform to the requirements of the Florida D.O.T. Standard Specifications for Road and Bridge Construction (Section 711) latest edition.

PART 2 - PRODUCTS

2.01 THERMOPLASTIC

A. All markings to be Alkyd thermoplastic only.

2.02 TEMPORARY MARKINGS

A. Temporary markings on final asphalt shall be only for backed construction tape. Lower asphalt lifts may be marked with paint or any other approved marking material.

2.03 REFLECTIVE PAVEMENT MARKERS (RPM'S)

A. RPM'S shall meet FDOT Class B Specifications, and shall be installed per Palm Beach County Typical T-3-89-004-PS.

PART 3 - EXECUTION

3.01 APPLICATION

A. Thermoplastic shall not be installed on roadway until five (5) calendar days after final lift of asphalt has been completed, with the exception of friction course which shall be thirty (30) days.

B. If existing marking material is not compatible with Alkyd thermosplastic, it shall be removed prior to installation of new markings.

END OF SECTION

SECTION 02934
SODDING

PART 1 - GENERAL

1.01 SCOPE

Provide all labor, materials and equipment necessary for complete sodding of areas affected by construction and not within the area covered by the Landscaping Plans. This shall include, but not be limited to: liming, fertilizing, sodding, necessary barriers, tests and all incidentals to make the work complete.

1.02 WORK INCLUDED

A. Testing of topsoil.

B. Raking and leveling topsoil as required for sodding.

C. Liming and fertilizing of topsoil.

D. Laying and rolling of sod.

E. Maintaining sod.

Part 2 - PRODUCTS

2.01 MATERIALS

A. Fertilizer:

1. Fertilizer shall be commercial fertilizer, as manufactured by International Chemical Company or approved equal.
2. Said fertilizer shall have a 10-20-6 N.P.K. content and contain a minimum of 60 percent of organic material.
3. It shall be delivered at the site in the original sealed containers.

B. Sod:

1. The sod shall be as grown by a certified turf nursery and CONTRACTOR shall inform ENGINEER as to the source of the sod to be utilized prior to ordering and delivery of sod.

2. Sod shall be furnished and installed in rectangular sod strips measuring 12 to 16-inches in width of standard lengths of not less than 2 feet and delivered on pallets.
3. After the preparation of the areas to be sodded has been approved by ENGINEER sod all previously sodded areas where no permanent construction exists. Supply and install sod which is equal to or approved equal to sod which exists at the project site. As a minimum, Type No. 1 sod composed of grasses grown from a Bahia Seed mixture shall be used for stabilization of final grade.
4. St. Augestine Floratam Sod shall be placed in areas that will be or are irrigated. Bahia sod shall be placed in areas not irrigated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. These areas shall be fine graded to achieve the finished subgrade after compaction which shall be obtained by rolling, dragging or by an approved method which obtains an equivalent compaction to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. All depressions caused by settlement or rolling shall be filled with additional existing or furnished topsoil and regraded and prepared as specified above until it presents a reasonably smooth and even finish at the required sod sub-grade.

B. All sod furnished shall be living sod containing at least 70 percent of thickly matter grasses as specified and free from noxious weeds.

C. No broken pads or torn or uneven ends will be accepted. Standard size sections of sod shall be strong enough to support own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section. Sod shall not be harvested when its moisture content (excessively wet or dry) may adversely affect its survival.

D. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not installed within this time period shall be subject to inspection and rejection by ENGINEER, and shall be removed from the side and a fresh sod supply shall be furnished at no extra cost to OWNER.

E. The topsoil shall not be moist at time of installation; however, it shall contain sufficient moisture so as not be powdery or dusty, both as determined by the supplier's representative.

F. The overlapping of existing lawn with new sod along limit of work lines will not be permitted. Sod shall be laid in strips, edge to edge, with the lateral joints staggered. All minor or unavoidable openings in the sod shall be closed with sod plugs or with

topsoil, as directed by ENGINEER. However, sod laid with joints determined to be too large shall be lifted and 43-laid as specified herein at no extra cost to OWNER.

G. Immediately after the sod is laid, the sod shall be watered thoroughly by hand or mechanical sprinkling until the sod and at least 2-inch of the top soil bed have been thoroughly moistened.

H. CONTRACTOR shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, OWNER shall furnish CONTRACTOR, upon request, with a source and supply of water. Contractor shall apply for temporary meter and pay Owner for water used at current utility billing rates. However, if OWNER' water supply is not available or not functioning, CONTRACTOR shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of, or the use of too much water, shall be CONTRACTOR's responsibility to correct.

3.02 MAINTENANCE

A. Maintain the entire sodded areas until final acceptance at the completion of the Contract. Maintenance shall include watering as specified, weeding and removal of stones which may appear. All bare or dead spots which become apparent shall be properly prepared, limed and fertilized, and resodded at CONTRACTOR's expense as many times as necessary to secure a good growth. In the event that the sod installation is not accepted by ENGINEER, the entire area shall be maintained and cut by CONTRACTOR until final acceptance of the sod installation.

B. Take whatever measures are necessary to protect the sod while it is developing. These measures shall include furnishing or warning signs, barriers, or any other necessary measures of protection.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

A. This section covers all work necessary for providing, testing and placing ready mix concrete.

B. See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, which contain information and requirements which apply to the Work specified herein and are mandatory for this project.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Not Used.

1.03 REFERENCE STANDARDS, CODES AND SPECIFICATIONS

A. ACI 214 "Recommended Practice for Evaluation of Compressive Test Results of Field Concrete".

B. ACI 318 "Building Code Requirement for Reinforced Concrete".

C. ASTM C31 "Standard Method for Making and Curing Concrete Compressive and Flexure Test Specimens in the Field".

D. ASTM C33 "Standard Specification for Concrete Aggregates".

E. ASTM C94 "Standard Specification for Ready-Mix Concrete".

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section 01300 - Submittals and shall include the following:

1. Concrete mix designs and trial mix laboratory reports.
2. Manufacturer's certification of admixtures.
3. Contractor's schedule and sequence of placement.
4. All Test Results.
5. Drawings showing locations of construction joints.

1.05 QUALITY ASSURANCE

A. Submit certificates of mill reports on all foreign cements for review by ENGINEER before batching concrete.

B. Secure the services of a reputable manufacturer for counseling regarding the use of any specified admixture.

C. The ENGINEER shall have access to and have the right to inspect all batch plants, cement mills, and supply facilities of suppliers, manufacturers, subcontractors, and contractors providing products included in these Specifications. Batch plants shall have current certification that all weighing scales have been tested and are within the tolerances as set forth in the National Bureau of Standards Handbook No. 44.

1.06 CERTIFICATION

A. Submit batch delivery tickets to the ENGINEER in compliance with and in accordance to ASTM C94.

1.07 TESTING

A. Performed by an acceptable Engineering Laboratory at OWNER's expense. CONTRACTOR shall assist in the collection of samples. Any retests shall be at CONTRACTOR's expense within the Scope of the Contract.

B. Criteria:
1. Each test: not less than 5 cylinders; retain one after 28 days.
2. One test for every 50 consecutive cubic yards of concrete cast.
3. Furnish ENGINEER with 4 certified copies of tests made of 2 prior to form removal, 2 at 28 days and 1 hold.

C. Questionable strength of in-place concrete:
1. Additional tests may be ordered by the ENGINEER.
2. Execute the core tests in accordance with ASTM C42 procedure.
3. Costs of additional tests showing strength of in-place concrete conforming to design criteria are the responsibility of the OWNER.
4. Costs of additional tests showing noncompliance with the design criteria are the responsibility of the CONTRACTOR.
5. Additional items at CONTRACTOR's expense:
   a. Provide load tests as directed by the ENGINEER.
   b. Reinforce structure as directed or remove and replace all under strength concrete structure in place.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cement

1. Portland cement Type I or Type II conforming to ASTM C 150. In addition, the tricalcium aluminate content of Type I cement shall not exceed 12 percent.
2. Type I or Type II cement, at the Contractor's option, may be used for nonhydraulic structures.

3.Type II cement or Type I cement, in combination with pozzolan (fly ash) as hereinafter specified, shall be used for all hydraulic structures and sanitary sewers.

B. Water: potable, salt free.

C. Fine Aggregate: salt free and clean, conforming to ASTM C33.

D. Coarse Aggregate: salt free and clean, conforming to ASTM C33, maximum size 3/4-inch.

E. All aggregates: quarried/mined in fresh water only.

2.02 MIXES

A. Fillets, thrust blocks, sidewalks, curbs and miscellaneous slabs on grade.
1. 28 day compressive strength: 3000 p.s.i.
2. Admixture: As required below, use only specified product.
3. Slump: 5 inches, ± 1 inch.
4. Air content (ASTM C 231): 4 to 6 percent.

B. Structural and precast concrete:
1. 28 day compressive strength: 4000 p.s.i., minimum, or as illustrated on the Drawings.
   a. Strengths noted on the Drawings take precedence over herein specified amounts.
2. Water-cement ratio: w/c £ 0.4.
3. Slump: 5 inches, ± 1 inch.
4. Air Content (ASTM C231): 4 to 6 percent.
5. Admixture: As required below, use only specified products.

C. Pavement:
1. 28 day compressive strength: 3000 p.s.i.
2. Water-cement ratio: w/c £ 0.4.
3. Slump: 5 inches, ± 1 inch.
4. Air Content (ASTM C231): 4 to 6 percent

5. Admixture: As required below, use only specified products.

D. Flowable Fill
1. Cement: 50 to 100 lbs/Cy.
2. Pozzolan (Flyash): 0 to 600 lbs/Cy.
3. Fine Aggregate: 2750 lb/Cy.
4. Water: 500 lbs/Cy. (Maximum)

2.03 ADMIXTURES

A. Air-Entraining

1. Provide air-entraining admixture in all concrete. Admixture shall conform to ASTM C 260, except it shall be nontoxic after 30 days and shall contain no chlorides. Furnish manufacturer's compliance statement for these requirements.

B. Water-Reducing

1. All concrete shall contain a water-reducing admixture. The admixture shall conform to ASTM C 494, Type A or Type D, except it shall contain no chlorides, shall be nontoxic after 30 days, and shall be compatible with the air-entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations. Furnish a compliance statement that the admixture used satisfies all requirements of this Specification.

C. Pozzolan (Fly-Ash)

1. The pozzolan to be used in combination with Type I cement, as previously F fly ash conforming to ASTM C 618 and furnish test data confirming that the fly ash in combination with the cement to be used meets all strength requirements, is compatible with air-entraining agents and other additives, and provides increased sulfate resistance equivalent to or better than Type II cement.

2.04 BONDING AGENT

A. Product shall be recommended by manufacturer as suitable to meet job requirements with regard to surface, pot life, set time, vertical or horizontal application, forming restrictions, etc. Furnish manufacturer's specific instructions for this job application, and obtain ENGINEER's review prior to purchase.

B. Bonding agent shall be Sikastix 370 as manufactured by Sika Corporation, or equal.

2.05 EVAPORATION RETARDANT

A. Evaporation retardant shall be used where specified to retard rapid evaporation of bleeding water from exposed concrete. The evaporation retardant may be used with or without fluorescent color tint which shall disappear completely upon drying. It shall be sprayed onto the surface of fresh concrete immediately after screeding to react with surface moisture and shall be reapplied after smoothing the surface with a bull float to ensure a continuous, compacted monomolecular layer. The evaporation retardant shall be CONFILM, as manufactured by Master Builders, Inc., or equal.

2.06 CURING COMPOUNDS

A. Normal placement without special finish; approved products:
1. Master Builders Company: "Masterseal".
2. Sonneborn-Contech: "Kure-N'Seal".

PART 3 EXECUTION

3.01 EXAMINATION

A. Place no concrete until all reinforcing steel, pipes, inserts, sleeves, conduits, etc., have been set in place and reviewed by the ENGINEER. Notify the ENGINEER of scheduled pours 24 hours prior to placement.

3.02 PLACING

A. Placement shall conform to the requirements and recommendations of ACI 304 and ACI 318, except as modified herein.

B. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 1.5 feet deep. The vertical free fall drop to final placement shall not exceed that hereinafter specified.

C. Place concrete expeditiously in clean forms that are not hot to the touch; spray forms with water just prior to placing concrete. Before placing concrete directly against earth, install vapor barrier to prevent water absorption, secure reinforcement in position, inspect, and approve before placing concrete. Do not rest runways for transporting concrete on the reinforcing steel. Deposit concrete as nearly as practical in final position; and, do not allow concrete to drop freely more than 5 feet. Place all concrete during daylight, unless otherwise authorized. Where reinforcing steel above the top of the cast is coated with concrete while placing below, remove all concrete from such reinforcing steel after the placing is complete and prior to the next cast.

D. Place slabs-on-grade carefully to avoid damages to the vapor barrier.

E. When placing concrete, use of aluminum pipe or other aluminum conveying devices will not be permitted.

F. Before depositing concrete, remove debris from the space to be occupied by the concrete. Prior to placement of concrete, dampen gravel fill under slabs on ground, dampen sand where vapor barrier is specified, and dampen all wood forms. Reinforcement shall be secured in position and acceptable to the ENGINEER before concrete is placed. Conform to ACI 304 and ACI 318 and to other requirements needed to obtain the finishes specified.

3.03 PUMPING CONCRETE

A. Pumping of concrete will be permitted with the ENGINEER's approval. If, in the ENGINEER's opinion, the pumped concrete does not produce satisfactory end results, the CONTRACTOR shall discontinue the pumping operation and proceed with the placing of concrete using conventional methods.

B. Minimum Pumping Equipment Requirements

1. The CONTRACTOR shall have a standby pump, conveyor system, crane and concrete bucket, or other system acceptable to the ENGINEER, on the site during pumping, in order to provide adequate redundancy to assure completion of the concrete placement without cold joints in the event of breakdown of the primary placing equipment.

2. The minimum diameter of the hose (conduit) shall be 4 inches.

3. Pumping equipment and hoses (conduits) that, in the opinion of the ENGINEER, are not functioning properly, shall be replaced.

4. Aluminum conduits for conveying the concrete shall not be used.

C. Pumped concrete field quality control samples for slump, test cylinders and shrinkage specimens will be taken at the placement (discharge) end of the line.

3.04 REMOVAL OF WATER

A. Unless the tremie method for placing concrete is specified, remove all water from the space to be occupied by the concrete.

3.05 CONSOLIDATION

A. Consolidate concrete in layers by internal vibrating equipment, supplemented by hand rodding and tamping as required. Do not use vibrators to move the concrete laterally inside the forms.

B. Maintain internal vibrators at speed of at least 5000 impulses per minute when submerged in concrete. Maintain at least 1 spare vibrator in working condition at site at all times.

C. Limit duration of vibration to time necessary to produce satisfactory consolidation without causing segregation. In no case more than 15 seconds per square foot of exposed surface. Move the vibrator constantly and place in each specific spot only once.

3.06 PLACING CONCRETE IN HOT WEATHER

A. Prepare concrete aggregates, mixing water, and other ingredients; place concrete; cure; and protect in accordance with the requirements of ACI 305. Provide special admixtures and special curing methods required by other paragraphs in this section even though not required by ACI 305 and ACI 318. Water-reducing and/or set-retarding admixtures shall be used in such quantities as recommended by the manufacturer to assure that the concrete is workable, and placement lift lines will not be visible in the architectural concrete finishes.

B. Every effort shall be made to maintain a concrete temperature below 90 degrees F at time of placement. Ingredients may be cooled before mixing to prevent excessive concrete temperature.

C. Provisions may be made for windbreaks, shading, fog spraying, sprink-ling or wet cover, when necessary.

D. Apply evaporation retardant as herein specified and in strict conformance with manufacturer's written instructions.

3.07 PLACING CONCRETE IN COLD WEATHER

A. Do not place concrete when the ambient temperature is below 40 degrees F, or approaching 40 degrees F and falling, without special protection as approved by the ENGINEER. No concrete shall be placed against frozen earth or ice, or against forms and reinforcement with frost or ice present.

3.08 JOINTS

A. Construction joints:
   1. Locate as illustrated on the Drawings and as reviewed by the ENGINEER for slabs.
   2. Key joints.

B. Construction joints shall be as specified in Section 03251 - Expansion and Construction Joints.

3.09 BONDING TO OLD CONCRETE

A. Coat the contact surfaces with bond agent specified hereinbefore. The method of preparation and application of the bonding agent shall conform to the manufacturer's printed instructions and recommendations for specific application for this project. Obtain this recommendation in writing from the manufacturer's representative.

3.10 CURING

A. Begin curing of concrete as soon as practicable after placing, but not more than 3 hours thereafter.

B. Continue curing of the structural elements immediately after removal of forms.

C. Apply curing compounds as specified.

D. Water curing methods are preferred for all water retaining structures in lieu of application of curing compounds.

Cure concrete by keeping the surface continuously wet for 7 days where normal Portland cement is used, or 3 days where high-early strength Type III cement is used. Subject to approval by the ENGINEER, one of the following methods shall be followed:

<u>WALLS</u>

1. Concrete forms shall be left in place and kept sufficiently damp at all times to prevent opening of the joints and drying of the concrete.

2. Exposed surfaces shall be continuously sprinkled.

<u>SLABS AND CURBS</u>

1. Protect surface by ponding; or

2. Cover with burlap or cotton mats kept continuously wet; or

3. Cover with 1-inch layer of wet sand, earth, or sawdust, and keep continuously wet; or

4. Continuously sprinkle the exposed surface; or

5. Spray surface with curing compound and when hard enough to sustain foot traffic on same day as pour, lay sprinkler hoses and cover with Visqueen sheets. Keep enough water from sprinkler hoses to keep surface of slab under Visqueen wet for full cure period; or

6. Other agreed upon method that will insure that moisture is present and uniform at all times on the entire surface of the slab.

3.11 PATCHING

A. Immediately after stripping forms, patch all defective areas with non-shrink non-metallic grout. Grout after curing shall match color of adjacent concrete. Patch defects as specified below or as designated by the ENGINEER. Clean, dampen, and fill all the holes with patching mortar.

1. Major defective areas, as judged by the ENGINEER, including those resulting from the leakage of forms, excessive honeycombs, large bulges, and large offsets at form joints: chip away to a depth of at least 1/4 inch; and, the surfaces that are to be patched coat with an epoxy-polysulfide adhesive. Press non-shrink, non-metallic grout in for a complete bond and finish to match adjacent areas.

2. Minor defective areas, as judged by the ENGINEER, including honeycombs, air bubbles, holes resulting from removal of ties and those resulting from leakage of forms: patch with non-shrink grout without resorting to chipping. Minor bulges and offsets at form joints: finish as specified herein below.

3.12 CONCRETE WALL FINISHES

A. Type W-1

1. All snap-tie holes shall be filled with non-shrink, non-metallic grout. All projections shall be KNOCKED OFF. Also all honeycomb areas and rock pockets shall be patched. Small air holes do not require patching.

B. Type W-2

1. All snap-tie holes shall be plugged with non-shrink, non-metallic color matched grout that has been approved by ENGINEER. GRIND OFF projections, fins, and

rough spots. Repair all other defects such as honeycomb areas, rock pockets, and rough spots which are a result of form release agent failure or other reasons with color matched non-shrink grout.

C. Type W-3

1. All snap-tie holes shall be plugged with non-shrink, non-metallic grout that has been approved by ENGINEER. GRIND OFF all projections, fins, and rough spots. Repair all defects as per type W-3. Apply a cementitious coating per Section 09900 - Protective Coatings or stucco per Section 09200 - Lath and Plaster as scheduled on the Drawings, or as specified in other sections.

3.13 CONCRETE SLAB FINISHES

A. General

1. The excessive use of "jitterbugs" or other special tools designed for the purpose of forcing the coarse aggregate away from the surface and allowing a layer of mortar to accumulate will not be permitted on any slab finish. The dusting of surfaces with dry materials will not be permitted. Slabs and floors shall be thoroughly completed by vibration. All edges of slabs and tops of walls shall be rounded off with a steel edging tool, except where a chamfered edge is indicated on the Drawings. Steel edging tool radius shall be 1/4-inch for all slabs subject to wheeled traffic.

B. Type S-1 (Steel Troweled Finish)

1. Finish by screeding and floating with straightedges to bring the surfaces to the required finish elevation shown on the Drawings. While the concrete is still green, but sufficiently hardened to bear a person's weight without deep imprint, it shall be wood floated to a true, even plane with no coarse aggregate visible. Sufficient pressure shall be used on the wood floats to bring moisture to the surface. After surface moisture has disappeared, the concrete shall be hand troweled to produce a smooth, impervious surface, free from trowel marks. An additional troweling shall be given the surface for the purpose of burnishing. The final troweling shall produce a ringing sound from the trowel. Dry cement or additional water shall not be used in troweling, nor will excessive troweling be permitted.

2. The slab finish tolerances and slope tolerances and/or repairs shall be as hereinbefore specified. Floor flatness measurements will be made the day after a concrete floor is finished and before the shoring is removed, in order to eliminate any effects of shrinkage, curling, and deflection. The 10-foot long straightedge shall be supported at each end with steel gauge blocks whose thickness are equal to specified tolerance. Floor surface shall not have crowns so high as to prevent 10-foot straightedge from resting on these two end blocks, nor low spots so low that a third block of twice the tolerance in thickness can easily pass under the supported 10-foot straightedge.

3. Compliance with the designated limits in four of five consecutive measurements should generally be satisfactory unless obvious faults are observed. A check for adequate slope and drainage will also be made to confirm compliance with these specifications.

C. Type S-2 (Wood float Finish)

1. Slabs to receive fill and mortar setting beds shall be finished by screeding with straightedges to bring the surface to the required finish plane. Slab shall be wood floated to compact and seal surface. All laitance shall be removed and the surface left clean. Subject to approval of the ENGINEER, an acceptable aggregate revealing material may be used and laitance washed off when concrete has set.

D. Type S-3 (Underside of Elevated Slab)

1. When forming is removed, the underside of slab shall have all projection ground off, all rock pockets and honeycomb area defects repaired.

E. Type S-4 (Exterior Broomed Finish)

1. Finish concrete as specified for Type S-1 floor finish above, except the final troweling shall be omitted and the surface shall be finished by drawing a fine-hair broom lightly across the surface. All brooming shall be in the same direction and parallel to expansion joints, or, in the case of inclined slabs, perpendicular to the slope, except for a round roof slab, broom surface in radial direction.

F. Type S-6 (Power Machine Finish)

1. In lieu of hand finishing, the CONTRACTOR may use an approved power machine for finishing concrete floors and slabs in accordance with the directions of the machine manufacturer and as approved by the ENGINEER. The use of a power machine will not be allowed when the concrete has not attained the necessary set to allow finishing without introducing high and low spots in the slab. The first steel troweling for slab Type S-1 finish should be done by hand.

3.14 BEAM AND COLUMN FINISHES

A. Type B-1

1. Knock off all fins and projections. Repair all rock pockets and honeycomb areas.

B. Type B-2

1. Beams shall be ground to remove all form marks. Repair all rock pockets.

C. Type B-3

1. Beams shall be ground to remove all form marks. Repair all rock pockets. Fill all air voids. Apply finishes as scheduled on the drawings.

D. Type C-1

1. Knock off all fins and projections. Repair all rock pockets and honeycomb areas.

E. Type C-2

1. Column shall be ground to remove all form marks. Repair all rock pockets.

F. Type C-3

1. Column shall be ground to remove all form marks. Repair all rock pockets. Fill all air pockets. Apply finishes as scheduled on the drawings.

3.15 FIELD QUALITY CONTROL

A. Only ready mixed concrete in accordance with ASTM C94 will be accepted.

B. Place all concrete within 1-1/2 hours after introduction of water to mix.

C. Under no circumstances may additional water be added to mix.

D. Discard unused concrete older than 1-1/2 hours. Retempering is prohibited.

END OF SECTION

SECTION 16000
ELECTRICAL GENERAL REQUIREMENTS

PART 1-GENERAL

1.01 RELATED DOCUMENTS

A. The general provisions of the Contract, including General Conditions, apply to all the work specified in the Electrical 16000 Sections.

1.02 LAWS, PERMITS, FEES AND NOTICES

A. Secure and pay all permits, fees and licenses necessary for the proper execution of the work. Submit all notices and comply with all laws, ordinances, rules and regulations of any public agency bearing on the work. Contractor shall be a licensed electrical contractor in the county of construction.

1.03 DEPARTURES

A. If any departures from the Contract Drawings or Specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted as soon as practicable to the Engineer for advance written approval.

1.04 GUARANTEES

A. Final Acceptance. Furnish written guarantee covering all materials, workmanship, labor and equipment for a period on one (1) year from the date of substantial completion as described in the Contract General Conditions.

B. The Owner reserves the right to operate and use all materials and equipment failing to meet the requirements of the Contract Documents until such unacceptable materials and equipment are replaced or repaired to the satisfaction of the Engineer.

1.05 AS-BUILT INFORMATION

A. A set of “red-lined” electrical drawings shall be carefully maintained at the job site. Actual conditions are to be put on the drawings in red on a daily basis so the drawings will continuously show locations and routes of cable trays, conduits, pull-boxes, circuit numbers, and other information required by the Engineer.

1.06 JOB SITE VISIT

A. Visit the project site before submitting a bid. Verify all dimensions shown and determine the characteristics of existing facilities which will affect performance of the work, but which are not shown on drawings or described within the specifications.

1.07 CLEANUP

A. Maintain a continuous cleanup during the progress of the work and use appointed storage areas for supplies. The premises shall be kept free from accumulations of waste materials and rubbish.

1.08 CUTTING AND PATCHING

A. Cut and prepare all openings, chases and trenches required for the installation of equipment and materials. Repair, remodel and finish in strict conformance with the quality of workmanship and materials in the surroundings. Obtain written permission from the Engineer for any alterations to structural members before proceeding.

1.09 MAINTENANCE

A. Render all necessary measures to ensure complete protection and maintenance of all systems, materials, and equipment prior to final acceptance. Any materials or equipment not properly maintained or protected to assure a factory new condition at the time of final acceptance shall be replaced immediately at no additional cost to the Owner.

1.10 WATERPROOFING

A. Whenever any work penetrates any waterproofing, seal and render the work waterproof. All work shall be accomplished so as not to void or diminish any waterproofing bond or guarantee.

1.11 TESTS

A. Conduct an operating test of equipment prior to the Engineer’s approval. The equipment shall be demonstrated to operate in accordance with the requirements of these Specifications. The tests shall be performed in the presence of the Engineer or an authorized representative. The electrical contractor shall furnish all instruments, electricity and personnel required for the tests.

1.12 SUMMARY OF ELECTRICAL WORK

A. Provide all labor, materials, tools, supplies, equipment and temporary utilities to complete the work shown on the drawings and specified herein. All systems are to be completely installed and fully operational. Specifically the work includes, but is not necessarily limited to:

1. Power service for Station 89.

2. New control pump panel.

3. Installation of RTU and pressure transmitters.

4. Conduit and wire as indicated on plans.

5. Grounding.

6. Start-up testing and documentation.

7. Lightning Protection.

1.13 CODES AND STANDARDS

A. General Applicable provisions of the following codes and standards and other codes and standards required by the State of Florida and local jurisdictions are hereby imposed on a general basis for electrical work (in addition to specific applications specified by individual work sections of these specifications):

1. U.L. : Electrical materials shall be approved by the Underwriters' Laboratories, Inc. This applies to materials which are covered by U.L. standards. Factory applied labels are required.

2. National Electrical Code.

3. OSHA: Standards of the Occupational Safety and Health Administration are to be complied with.

4. NEMA: National Electrical Manufactures Association Standards are to be met wherever standards have been established by that agency, and proof is specifically required with material submittals for switchboards, motor control centers, panel boards, cable trays, motors, switches, circuit breakers, and fuses.

5. ANSI: American National Standards Institute.

6. NESC: National Electrical Safety Code.

1.14 ELECTRICAL TEMPORARY FACILITIES

A. The electrical contractor shall include in his bid the cost of furnishing, installing, maintaining, and removing all materials and equipment required to provide temporary light and power to perform the work of all trades during construction and until work is completed.

B. Safety

1. All reasonable safety requirements shall be observed to protect workers and the public from shock and fire hazards. Ground fault interrupters shall be employed in accordance with codes.

2. Ground wires are required in all circuits. Ground poles are required on all outlets. All metallic cases shall be grounded.

3. Rain tight cabinets shall be used for all equipment employed in wet areas.

1.15 EXCAVATING FOR ELECTRICAL WORK

A. General

1. Excavation or drilling, backfill and repair of paving and grassing is to be in the bid of the electrical contractor. The actual work need not be performed by electrical trades. However, the electrical contractor is responsible for all excavation, drilling, dewatering, backfilling, tamping, and repair of pavements and grassing required in support of electrical work. All areas disturbed by electrical work shall be repaired to their original condition, or as indicated on the drawings.

B. Coordination

1. The electrical contractor must check for existing utilities before commencing any excavation or drilling.

2. Contract drawings and other trades are to be consulted to avoid interferences with other utilities on this project.

3. In the event of damage to existing utilities, the Engineer shall be immediately notified, and damage shall be immediately repaired.

4. The Owner is to be consulted to ascertain locations of existing interferences by referring to "As Built" drawings and Owner's experience. The excavations are to be scheduled at the Owner's convenience.

C. Precautions
1. The electrical contractor must take every reasonable precaution to avoid interferences. In the vicinity of a suspected interference, excavations shall be dug by hand.

1.16 ELECTRICAL SUBMITTAL

A. Submittals for Approval

1. Refer to Section 01300 – Submittals for additional instructions on and this Section, the more stringent requirements shall apply.

2. Shop Drawings and manufacturer's data sheets are required for all electrical materials.

3. Submittals will not be accepted for partial systems. Submit all materials for each specifications section at one time. Submittals must be arranged, correlated, indexed and bound in orderly sets for ease of review.

4. Samples are to be supplied for any substitute as requested by the Engineer.

5. Submit shop drawings, manufacturer's data, and certifications on all items of electrical work prior to the time such equipment and materials are to be ordered. Order no equipment or materials without approval from the Engineer. Submittals will not be accepted for partial system submittals; submit all data at one time.

6. Contractor shall be responsible for investigating existing systems or shop drawings in order to fully integrate the new equipment into the system. Adequate shop drawings may or may not exist for all existing systems.

B. Operation and Maintenance Manuals

1. Submit all manufacturer's service, installation and operation manuals, instructions and bulletins. These manuals shall be subject to review of the ENGINEER. If acceptable they shall be forwarded to the OWNER. If not acceptable they shall be returned to the CONTRACTOR for revision and resubmittal. Manuals shall contain but not be limited to the following:

   a. Brief description of systems and basic features.
   b. Manufacturer's name and model number for all components in the system.

List of local factory authorized service companies

a. Operating instructions.
b. Maintenance instructions.
c. Trouble shooting instructions.
d. Manufacturer's literature describing each piece of equipment.
e. Power and control wiring diagrams.
f. Parts Lists.

1.17 ELECTRICAL PRODUCTS

A. Standard Products

1. Unless otherwise indicated in writing by the Engineer, the products to be furnished under this specification shall be the manufacturer's latest design. Units of equipment and components of the same purpose and rating shall be interchangeable throughout the project. All products shall be newly manufactured. Defective equipment or equipment damaged in the course of installation or test, shall be replaced or repaired in a manner meeting with the approval of the Engineer at no additional expense to the Owner.

B. Delivery, Storage, and Handling

1. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identification; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior instructions for storage locations.

C. Substitutions

1. Comply with instructions in the Contract General Conditions and obtain pre-approval of the engineer regarding substitutions.

1.18 ELECTRICAL IDENTIFICATION

A. Color Coding Conductor colors shall be in accordance with the N.E.C. and NFPA requirements. Refer also to applicable sections of these specifications. Three phase feeder and branch circuits shall be identified as follows:

120/240	277/480
A-Black	A-Brown
B-Red	B-Orange
C-Blue	C-Yellow

Neutral – White Neutral - Gray

B. Nameplates

1. The following items shall be equipped with nameplates: All motors, motor starters, motor control centers, pushbutton stations, control panels, time switches, disconnect or relays in separate enclosures, receptacles, wall switches, high voltage boxes and cabinets. All light switches and outlets shall carry a phenolic plate with the supply Special Electrical systems shall be identified at junction and pull boxes, terminal cabinets and equipment racks.

2. Nameplates shall adequately describe the function of the particular equipment involved. Nameplates for panel boards and switchboards shall include the panel designation, voltage and phase of the supply. For example, "Panel A, 277/480V, 3-phase, 4-wire." The name of the machine on the motor nameplates for a particular machine shall be the same as the one used on all motor starters, disconnect and P.B. station nameplates for that machine. Normal power nameplates shall be laminated phenolic plastic, white front and back with black core, with lettering etched through the outer covering; black engraved letters on white background. Lettering shall be 3/16 inch high at pushbutton stations, thermal overload switches, receptacles, wall switches and similar devices, where the nameplate is attached to the device plate. At all other locations, lettering shall ¼ inch high, unless otherwise detailed on the Drawings. Nameplates shall be securely fastened to the equipment with No. 4 Phillips, round-head, cadmium plated, steel self-tapping screws or nickel-plated brass bolts. Motor nameplates may be non-ferrous metal not less than 0.03 inch thick, die stamped. In lieu of separate plastic nameplates, engraving directly on device plates is acceptable. Engraved lettering shall be filled with contrasting enamel. Equipment nameplate schedule for all equipment shall be submitted with shop drawing submittal for Engineer's approval.

3. All junction and splice boxes shall be labeled using permanent shipping tags attached to boxes; not covers.

C. Wire and Cable Identification

1. All wire and cable shall be identified at each termination point and at each pull box, splice box, junction box, or manhole. Provide permanent, waterproof, non-metallic (paper unacceptable) tags indicating the circuit number in 3/16 inch letters.

2. Individual wires within equipment enclosures shall be identified using the equipment manufacturer's shop drawing wire numbers. Panel wire numbers

and terminal numbers shall agree. Wire markers shall be T&B shrink-kon HVM marker heat shrink system or an equal.

D. Signs

1. Warning signs shall comply with OSHA requirements and reasonable safety precautions.

END OF SECTION

SECTION 16050
BASIC MATERIALS AND METHODS

PART 1-GENERAL

1.01 WORK INCLUDED

A. The work covered by this section of the Specifications consists of furnishing all plant, labor, material and equipment, and in performing all operations necessary for the construction of the electrical work, complete and ready for use. The work shall include, but shall not be limited to the furnishing and installing of materials and equipment to provide a complete electrical system in strict accordance with the specifications, as shown on the drawings, and as is necessary and incidental to the proper operation of the electrical equipment described for the project. Omission of a special electrical item obviously necessary for the proper functioning of equipment shall not relieve the Contractor of the responsibility of furnishing the item as a part of the work.

B. The Work shall include complete testing of all equipment and wiring at the completion of the Work and making any minor connection changes or adjustments necessary for the proper functioning of the systems and equipment. All workmanship shall be of the highest quality; substandard work will be rejected.

C. It is the intent of these Specifications that the electrical system shall be suitable in very way for the service required. All material and all work which may be reasonably implied as being incidental to the Work of this Section shall be furnished within the Scope of the Contract.

D. Like items provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, operation and maintenance.

E. See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, which contain information and requirements that apply to the Work specified herein and are mandatory for this project.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 13700 – Process Instrumentation and Controls.

B. Section 16000 – Electrical General Requirements.

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. All work shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.

B. All materials and installations shall comply with the applicable standards of the National Electrical Manufacturers Association (NEMA) and Underwriters' Laboratories (UL).

C. It shall be the responsibility of the Contractor to install all work in conformance with all applicable codes to requirements of all authorities having jurisdiction and to the regulations of related utility companies.

D. Any changes to the design to comply with these codes shall be included in the Bid.

E. When a change is required, the Contractor shall send a copy of the change to the Engineer/Owner and indicate the reasons. In no case shall any change be made if the design exceeds the minimum requirements of these codes.

1.04 INTERPRETATION OF DRAWINGS

A. The Drawings are not intended to show exact locations of conduit runs.

B. Unless otherwise directed by the ENGINEER, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

C. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.

D. Harmonize the Work of the different trades so that interferences between conduits, piping, equipment and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets and fittings, required to accomplish this shall be furnished and installed within the Scope of the Contract. In case conflict develops, the ENGINEER'S and/or OWNER'S authorized representative will decide which equipment or piping, must be relocated, regardless of which was installed first.

E. The locations of electrical equipment and similar devices shown on the Drawings are approximate only. Exact locations shall be as accepted by the ENGINEER during construction. Vendor's approved shop drawings shall be used for dimensions of equipment. Obtain in the field all information relevant to the placing of electrical work and in case of any interferences with other work, proceed as directed by the ENGINEER and furnish all labor and materials necessary to complete the Work in a workmanlike manner.

F. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.

G. All connections to equipment shall be made in accordance with the approved shop and setting drawings.

1.05 SUBMITTALS

A. Submittals shall be made in accordance with Section 01300 - Submittals.

B. Submittals shall be made for all specified equipment and materials. Submittal data shall include but not be limited to catalog data, cut sheets, manufacturer's name and model number.

C. No material or equipment shall be ordered or shop work started until the ENGINEER'S review of submittals has been completed.

1.06 QUALITY ASSURANCE

A. Work under this Section shall be accomplished by persons skilled in performance of the required work. All work shall be done in a first class manner in keeping with conventions of the trade. Work under this Section shall be closely coordinated with work of other trades to avoid conflict and interference.

B. The electrical subcontractor shall have experience in similar projects and shall employ a qualified supervisor with responsible experience in similar work who shall be in direct charge at all times.

1.07 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall use all means necessary to protect the materials and equipment of this Section before, during and after installation and to protect the installed work and material of all other trades. In the event of damage, immediately make all repairs and replacements necessary for the approval of the Engineer/Owner at no additional cost to the Owner.

B. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the CONTRACTOR at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the ENGINEER, at the cost and expense

of the CONTRACTOR, or shall be replaced by the CONTRACTOR within the Scope of the Contract.

1.08 WARRANTY

A. Provide warranties for all the electrical and instrumentation equipment in accordance with the requirements of Section 01740 – Warranties and Bonds.

PART 2 – PRODUCTS

2.01 MATERIALS

A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or manufacturer's specifications shall be submitted for review as required by the ENGINEER.

B. Materials and equipment used shall be labeled and listed by UL or FM wherever standards have been established and label service is regularly furnished. All products shall conform with the applicable standards of NEMA and ANSI.

2.02 CONDUIT

A. PVC conduit shall be rigid Schedule 80, sunlight resistant and used as per locations noted within these specifications unless otherwise noted, and shall be U.L. approved and comply with Federal Spec WC-1094 and NEMATC-1.

B. Rigid galvanized steel (RGS) shall be heavy wall threaded, hot dipped galvanized inside and outside.

C. Liquid tight flexible metal conduit (Flex) shall be galvanized steel inside and outside with moisture and oil proof PVC jacket extruded over the outside with a continuous copper ground under the jacket.

D. PVC coated Rigid galvanized steel shall be Rob Roy, 2 MILS inside and 40 MILS outside. All fittings shall match.

2.03 CONDUIT CONNECTION

A. Conduit connections shall be nonmetallic, liquid tight strain relief connectors – straight, as manufactured by T&B or equal.

2.04 CABLE, WIRE AND CONNECTORS

A. 600 Volt Power Wiring

1. Cable shall be rated for 600 volts and shall meet the requirements below:

   a. Conductors shall be stranded.

   b. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing; not older than 12 months.

   c. Type of wire shall be THWN except where required otherwise by the contract drawings.

   d. No wire smaller than No. 12 gauge shall be used unless specifically indicated.

   e. Conductor metal shall be copper.

   f. All conductors shall be meggered after installation and insulation must be in compliance with the National Electrical Code.

B. Instrumentation and Control Cable

1. Process instrumentation wire shall be 16 gauge twisted pair, 600 V., cross-linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed, type “XLP” as manufactured by the American Insulated Wire Co., Eaton Corp. “Polyset” or equal. Multiconductor cables with individually shielded twisted pairs shall be installed where indicated.

2. Multiconductor control cable shall be stranded 14 gauge, 600V., cross-linked polyethylene insulated with PVC jacket, type “XLP” as manufactured by the American Insulated Wire Co., Eaton Corp. “Polyset” or equal.

2.05 OUTLETS AND BOXES

A. Outlets, junction boxes, conduits and pull boxes shall be of adequate size for the number of wires run into them. Pull boxes shall be installed where necessary and shall be placed in accessible location. All junction boxes and conduit fittings shall be cast of cadmium finished malleable iron.

B. Where disconnects are installed outside, provide a 600V, 3-pole, nonfusible switch in a NEMA 4X, stainless steel enclosure.

C. Switches shall be horsepower rated and as manufactured by the Square D Co., or equal.

D. Auxiliary contacts shall be provided where required on plans.

2.06 SAFETY DISCONNECT SWITCH

A. Fusible and non-fusible disconnect switches shall be heavy-duty, NEMA type H, quick-make, quick-break, visible blades, 600 volt, 3 pole with full cover interlock. Outside switches shall have copper Lugs.

B. Where disconnects are installed outside, provide a 600v, 3-pole, non-fusible switch in a NEMA 4X, stainless steel enclosure.

C. Switches shall be horsepower rated and as manufactured by the Square D Co., or equal.

D. Auxiliary contacts shall be provided where required on plans.

2.07 TERMINATIONS AND SPLICES (600 VOLTS AND LESS)

A. Terminations of power cable shall be by means of U.L. approved connectors. All connectors shall meet U.L. 486B and shall be compatible with the conductor material.

B. Terminate all control and instrumentation cable with fork type compression lugs.

C. Splicing of power, control, or instrumentation wiring will not be allowed except by written approval of the Engineer. Where splicing is allowed, splices shall be made with approved compression connectors, and splices shall be made waterproof at outdoor locations.

2.08 BOXES

A. Boxes for wiring devices (switches and receptacles) installed outdoors shall be weatherproof fiberglass with polycarbonate cover plates. Junction boxes shall be fibergalss with gasketed covers. All boxes shall be securely mounted plumb and level in readily accessible locations. Indoor boxes shall have stainless steel cover plates.

B. Unless otherwise indicated, all outdoor junction boxes and pull boxes shall be NEMA 4X stainless steel or fiberglass.

2.09 AUXILIARY GUTTERS

A. Gutters shall be provided per NEC Article 374.
B. Minimum gauge steel shall be 12. Gutters shall be painted with one prime coat and two finish coats. Final coats shall match other electrical enclosures.

C. Submit shop drawings for all gutters.

2.10 MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT

A. Furnish and install all supports, hangers, and inserts required to mount fixtures, conduits, cables, pullboxes, and other equipment furnished under this section or furnished for installation under this section

B. Perforated straps and wire are not permitted for supporting electrical devices. Anchors shall be of approved types.

C. Framing channels for mounting disconnect switch, remote terminal unit (RTU) and FPL meter shall be minimum 1-5/8-inch width series type 316 stainless steel channels as manufactured by Unistrut, or equal.

D. Pipe clamps, nuts, bolts, washers and other miscellaneous installation hardware shall be type 304 or 316 stainless steel.

PART 3- EXECUTION

3.01 GENERAL

A. Prior to all work of Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Install all electrical work to conform with job site conditions and all Drawings and Specifications.

B. All “tight” conditions shall be worked out in advance by the Contractor with all involved trades. In the event of any discrepancy, immediately notify the Engineer/Owner. Do not proceed with any installation in the area of the discrepancy until it has been fully resolved. No additional cost will be considered for work which must be relocated due to the conflicts with the work of other trades.

C. Install all equipment, systems and materials in strict accordance with manufacturers’ recommendations and NEMA standards for installation. If this in any way causes conflicts, immediately notify the Engineer/Owner.

D. Provide all mounting supports and accessories as required to install all equpment and all system components. Correlate the Shop Drawings as applicable.

3.02 EXCAVATION FOR ELECTRICAL WORK

A. The work of this article is defined to include whatever excavating and backfilling is necessary to install the electrical work. Coordinate the work with other excavating and backfilling in the same area, including dewatering, flood protection provisions and other temporary facilities. Coordinate the work with other work in the same area, including other underground services (existing and new), landscape development, paving and floor slabs on grade. Coordinate with weather conditions and provide temporary facilities needed for protection and proper performance of excavation and backfilling.

3.03 CONCRETE FOR ELECTRICAL WORK

A. The work of this article is defined to include whatever concrete work is necessary or shown specifically to install the electrical work.

B. Concrete shall be as specified in Section 03300 – Concrete.

3.04 WATERPROOFING

A. Use watertight fittings on panel or other equipment to keep out water. Seal conduits coming from wetwell with duct seal to keep out moisture.

B. Where support holes are drilled in panel or boxes, seal with butyl rubber or other approved sealing compound inside and out.

3.05 CONDUIT USES PER LOCATIONS

A. Conduits shall be used as follows:

1. Schedule 40 PVC conduit shall be used in locations indoors or outdoors where not exposed, including underground locations, unless otherwise indicated on the drawings. Exposed stub-ups outside shall be made using schedule 80 PVC 90 degree bends.

2. PVC schedule 80 shall be used in all exposed areas indoors and outdoors.

3. Flex shall be used for all connections to vibrating equipment or where flexibility is required for servicing of equipment.

4. PVC coated Rigid galvanized steel shall be used for all hazardous areas such as wetwells.

3.06 CONDUIT INSTALLATION

A. Conduits entering panelboards, pull boxes, or outlet boxes shall be secured in place by locknuts and bushings, one (1) locknut outside and one (1) locknut inside of box with busing on conduit end. The locknuts shall be tightened against the box without deforming the box. Bushings shall be of the insulating type.

B. Field conduit bends shall be made with standard tools and equipment manufactured especially for conduit bending.

C. Exposed runs of conduits shall be installed with runs parallel or perpendicular to walls, structural members or intersections of vertical planes and ceilings, with right angle turns consisting of symmetrical bends or pull boxes as indicated on the drawings. Bends and offsets shall be avoided where possible.

D. Pull wires shall be installed in all empty conduits. Pull wires shall be No. 12 gauge copper. All pull wires shall be identified with conduit number at each end.

E. Where conduits are run individually, they shall be supported by approved pipe straps, secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces, and wood screws on wood construction. The use of perforated straps or wires will not be permitted.

F. Concrete inserts and pipe straps shall be galvanized. Steel bolts, nuts, washers, and screws shall be galvanized or cadmium-plated. Individual hangers, trapeze hangers and rods shall be prime-coated and painted.

G. Wire shall not be installed until all work of any nature that may cause damage is completed, including pouring of concrete. Mechanical means shall not be used in pulling in wires No. 8 or smaller.

H. Underground conduits not under concrete slabs are to be buried at least two (2) feet below finished grade for circuits rated 600 volts or less, except under traffic areas where motor vehicles may cross. Under traffic areas, conduits are to be buried at least three (3) feet below finished grade. Six-inch wide yellow “Electrical Warning Tape” shall be installed 12 inches below final grade directly above all yard conduit runs.

I. All conduits shall be cleaned by pulling a brush swab through before installing cables.

J. All conduits shall be sealed at each end with electrical putty. Special care shall be taken at all equipment where entrance of moisture could be detrimental to equipment.

3.07 MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT

A. Furnish and install all supports, hangers, and inserts required to mount fixtures, conduits, cables, pull boxes, and other equipment furnished under this section or furnished for installation under this section.

B. Perforated straps and wire are not permitted for supporting electrical devices. Anchors shall be of approved types.

C. All floor mounted devices (switchboards, motor control centers, transformers, etc.) shall be securely anchored to the floors. Where recommendations are made by manufacturer, these recommendation shall be followed.

D. Pipe stands shall be constructed for supporting electrical and I&C equipment . Unless otherwise indicated, all materials shall be 316 stainless steel including all hardware. Pipe stands shall be set a minimum of 36” x 12” diameter concrete encasement. Encased pipe shall be coated with bitumastic coating. Unless otherwise indicated, top of equipment mounting height shall be approximately 60” above final grade but shall be increased as required to maintain a minimum of 12” from bottom of equipment enclosure to the final grade.

3.08 WIRING TO PUMPS

A. All connections to pump motor and exterior equipment shall be made using waterproof connectors.

END OF SECTION

Appendix A

CITY OF DELRAY BEACH

DELRAY BEACH
All-America City
1993
2001

ENVIRONMENTAL
SERVICES DEPARTMENT

Mr. Jeffrey A. Lindley
Office of Transportation Operations
Federal Highway Administration
400 7'" Street, SW
Washington, D.C. 20590

RE: Request for Interim Approval of Green Colored Pavement in Bicycle Lanes

Mr. Lindley:

The City of Delray Beach requests approval for the use of green colored pavement in marked bicycle lanes and in extensions of bicycle lanes through intersections and traffic conflict areas within our jurisdiction.

Delray Beach has a significant number of bicyclists that use our streets, paths and designated bicycle routes to travel to and from destinations. Our goal is to enhance the safety and visibility of our bicycle lanes.

According to IA-14, the City is willing to abide by the following requirements:

- We shall comply with the technical conditions listed in IA-14
- We agree to maintain an inventory of all locations where the green colored pavement is installed
- Per section 1A.10 of the 2009 MUTCD, we agree to restore the site of the Interim Approval to a condition that complies with the provisions of the MUTCD within 3 months following the Issuance of a final rule on this traffic control device.
- The City agrees to terminate the use of the device at any time if it is determined to be a Significant safety concern.

If you have any questions, comments or require additional information, please contact me at (561) 243-7322 or Krejcarek@mydelraybeach.com. Thank you for your consideration and time.

Sincerely,

Randal L. Krejcarek, P.E.
LEED AP, GISP
Director of Environmental Services

S:\EngAdmin\Projects\2011\11-067 made file 8-2011\LETTERS\green bike lane request.doc

U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

SEP 19 2014

In Reply Refer to:
HOTO-1

Randal L. Krejcarek, P.E.
Director of Environmental Services
City of Delray Beach
434 South Swinton Avenue
Delray Beach, FL 33444

Dear Mr. Krejcarek:

Thank you for your September 3 letter requesting approval to use green-colored pavement in marked bicycle lanes on a citywide basis in the City of Delray Beach exclusive of the State highway system. Your request was made under the provisions of Section 1A.10 in the 2009 edition of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) and our Interim Approval memorandum dated April 15, 2011 for the optional use of green-colored pavement for bike lanes.

Your request is approved. It is recommended that you periodically provide a list of locations where the device will be used to the Florida Department of Transportation in accordance with Paragraph 20 of Section 1A.10 in the MUTCD.

For recordkeeping purposes, we have assigned your request the following Interim Approval number and title: "IA-14.64 – Green-Colored Pavement for Bicycle Lanes – City of Delray Beach, FL." Please reference this number in any future correspondence.

Thank you for your interest in improving highway safety for bicyclists.

Sincerely yours,

Mark R. Kehrli
Director, Office of Transportation
Operations

Appendix B

TRAFFIC CONTROL SIGNALS AND DEVICES

SECTION 603
GENERAL REQUIREMENTS FOR TRAFFIC CONTROL SIGNALS AND DEVICES

603-1 Description.

The provisions contained in this Section include general requirements for all traffic control signals and devices.

603-2 Equipment and Materials.

603-2.1 General: Only use traffic control signals and devices that are listed on the Department's Approved Product List (APL). Manufacturers seeking evaluation of their products for the APL must submit an application in accordance with Section 6.

Only use new equipment and materials, except as specified in the Contract.

603-2.2 Exceptions: The Department may grant exceptions to the requirements of 603-2.1 by permit to evaluate new technology or for other circumstances that are found to be in the public interest.

603-2.3 Uniformity: Only use compatible units of any one item of equipment, such as signal heads, detectors, controllers, cabinets, poles, signal system or interconnection equipment, etc.

603-2.4 Hardware and Fittings Used for Installation: Ensure that all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Use stainless steel bolts, screws and studs meeting the requirements of ASTM F593. Use nuts meeting the requirements of ASTM F594. Ensure all assembly hardware greater than or equal to 5/8 inch in diameter is galvanized. Use bolts, studs, and threaded rod meeting the requirements of ASTM A307. Use structural bolts meeting the requirements of ASTM A325.

Use high-strength steel anchor bolts and U-bolts, having a minimum yield strength of 55,000 psi and a minimum ultimate strength of 90,000 psi.

603-2.5 Galvanizing: Meet the requirements of Section 962 when galvanizing for fittings and appurtenances for all structural steel (including steel poles).

603-2.6 Environmental Specifications: Ensure system electronics intended for installation outdoors or within a roadside cabinet satisfactorily performs all required functions during and after being subjected to the environmental testing described in National Electrical Manufacturers Association (NEMA) TS2, 2.2.7, 2.2.8, and 2.2.9.

603-3 Definitions.

Traffic Control Signals and Devices: Any signal or device; manually, electrically or mechanically operated, by which traffic is alternately directed to stop and permitted to proceed or controlled in any manner. Traffic control signals and devices regulate, warn, or guide traffic on, over or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction. Traffic control signals and devices include, but are not limited to, controller assemblies (controller cabinets and their contents); signal heads including their hanging or mounting devices; vehicle detection systems ; pedestrian detection systems; motorist

information systems, video equipment, network devices, dynamic message signs, highway advisory radios, cameras, and other equipment used within a traffic control system.

603-4 Systems Approval Requirement.

The Engineer will review and approve any system design plan of traffic control signals and devices, that is controlled or operated from a remote location by computers or similar devices, and which affects the movement of traffic on any portion of the State Highway System, prior to installation.

603-5 Submittal Data Requirements.

Prior to the installation of equipment and within 30 days after the preconstruction conference, submit a listing of all traffic control signals, devices, and hardware with Department APL approval numbers to the Engineer for approval on Form 750-010-02, Submittal Data - Traffic Control Equipment. Alternate or modified forms are unacceptable. Submit a separate form for each cabinet location. For non-structural equipment or materials that do not have an APL approval number, submit the manufacturer's descriptive literature and technical data fully describing the equipment to the Engineer for approval. The Engineer will submit forms received from the Contractor to the District Traffic Operations Engineer for concurrence.

Develop shop drawings for all structural support materials and other special designs, such as non-electrical, non-mechanical, or other fabricated items, which may not be specifically detailed in the Plans. Have the Specialty Engineer approve all shop drawings. Do not submit shop drawings for those items that have been previously evaluated and approved. Provide a complete operable signal installation as specified in the Contract regardless of any failure of the Department to discover or note any unsatisfactory material.

603-6 Documentation for Electronic Equipment.

Prior to final acceptance, submit the following documentary items obtained from the manufacturer for the electronic equipment listed below:

1. Operation Manual
2. Troubleshooting and Service Manual
3. Assembly and installation instructions
4. Pictorial layout of components and schematics for circuit boards
5. Parts list
6. Diagram of the field installation wiring (not applicable to the detectors)
7. Warranty information

Submit documentary items for the following equipment:

1. Controllers
2. Vehicle detectors
3. Load switches
4. Flasher units
5. Preemption units
6. Conflict monitors
7. Special sequence relays
8. Cameras
9. Dynamic message signs
10. Highway advisory radios

11. Road weather information systems
12. Any other equipment which has a logic, timing, or communications function
13. Other equipment specified in the Contract Documents

603-7 Department-Furnished Equipment Installed By Contractor.

Where the Contract includes installation of Department-furnished equipment, the Department will turn over such equipment to the Contractor when the construction progress allows or as designated in the Contract. The Department will test and certify the equipment to be in proper condition and ready to use and will bear the costs of correcting any defects in the equipment prior to pick-up by the Contractor. The Engineer will coordinate the pick-up and installation of the equipment. Maintain the equipment in proper operational condition after pick-up at no cost to the Department, until either final acceptance or the equipment is returned to the Department.

SECTION 608
MANUFACTURERS' WARRANTIES FOR TRAFFIC CONTROL SIGNALS AND DEVICES

608-1 Description.

This Section sets forth manufacturers' warranty requirements for traffic control signals and devices furnished to the Department. Manufacturer and Contractor costs associated with transferring, submitting, and delivering equipment warranties, requirements, terms, and conditions are part of the work and are included in the pay item for the equipment or construction feature utilizing the equipment.

608-2 Manufacturers' Warranty Provisions.

608-2.1 General: Submit all warranties provided by the equipment manufacturer for the specific equipment included in the Contract. Ensure that all warranties are fully transferable from the Contractor to the owner of the equipment within the project limits. Ensure that warranties cover defects for at least the duration specified in the Contract Documents from the date of final acceptance in accordance with 5-11. Transfer warranties upon final acceptance in accordance with 5-11. Submit all warranties and warranty transfers to the Engineer.

In accordance with 611-5, the Contractor's responsibility for warranty repairs, warranty replacement, troubleshooting, or other costs associated with repair or replacement of traffic control signals and devices within the contract's project limits will terminate 90 days after final acceptance in accordance with 5-11.

608-2.2 Terms and Conditions: Ensure that the terms and conditions of warranties are documented by the manufacturer for equipment submittals on construction projects. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement.

Ensure warranties require the manufacturer to furnish replacements for any part or equipment found to be defective during the manufacturer's warranty period at no cost to the owner of the equipment within the project limits.

SECTION 611
ACCEPTANCE PROCEDURES FOR TRAFFIC CONTROL SIGNALS AND DEVICES

611-1 Description.

This Section sets forth Contract acceptance procedures for installations of traffic control signals and devices and for equipment purchase contracts.

611-2 Acceptance of Traffic Control Signal and Device Installations.

611-2.1 Partial Acceptance: The Engineer may make inspection for partial acceptance under the Contract in accordance with 5-10 of a complete traffic control signal and device installation upon its completion in accordance with the Contract Documents and at such time that other parts of the total Contract are at a stage of completion that either require or allow the installation to operate in a manner which is in accordance with the Contract Documents. Before inspection for partial acceptance, the Engineer will require the satisfactory completion of all field tests of completed installations in accordance with the requirements of 611-4. The Engineer will make inspection for partial acceptance in accordance with 5-10 in company with a Contractor's representative and, when applicable, a representative of the agency designated to accept maintenance responsibility.

611-2.2 Final Acceptance: The Engineer will make inspection for final acceptance of traffic control signal and device installations as part of all work under the Contract in accordance with 5-11, only after satisfactory completion of all field tests of completed installations and on the basis of a comprehensive final field inspection of all equipment installations. Submit Form 750-010-02, Submittal Data – Traffic Control Equipment for each cabinet location, to the Engineer. The Engineer will make the final inspection with a Contractor's representative and, when applicable, a representative of the agency designated to accept maintenance responsibility. The Engineer will submit the approved form to the District Traffic Operations Engineer and place a hard copy in the cabinet at each location. Transfer warranties and guarantees on equipment to the Department in accordance with Section 608. For traffic signal installations, submit form 700-010-22, Final Acceptance of Traffic Signal Installation(s) and Transfer of Maintenance, to the Engineer.

611-2.3 As-Built Drawings: As a condition precedent to acceptance under 611-2.1 or 611-2.2, submit signed and sealed as-built drawings of all installations:

611-2.3.1 Submittal Requirements: Submit as-built plans for review by the Engineer. As-built plans must be PDF files, in the same scale as the Contract Plans, and formatted on 11 inch by 17 inch sheets. Signing and pavement marking plan sheets may be used instead of signalization plan sheets, if a substantial number of changes from the original Plans must be recorded. If, in the opinion of the Engineer, the changes cannot be clearly delineated on the existing drawings, clearly delineate all changes on 11 inch by 17 inch detail sheets, enlarged 200% from the reproductions.

Submit fiber optic splicing diagrams detailing all cable splices, terminations, equipment port assignments, and optical circuits within the communication network.

As-built submittals must include an inventory of all traffic control signals and devices, and support structures. The inventory must include horizontal position geographic coordinate data collected using Differential Global Positioning System (DGPS) equipment. The inventory must include the manufacturer, model, and serial number for each device or completed

assembly. Submit coordinate data for pull boxes as well as conduit and cable at 100 foot intervals including changes in direction.

Aerial photographs may be submitted with as-built submittals to provide supplementary information. The aerials should not include extra features such as the right of way, baseline, or roadway edges. The aerials may be used as a base for the as-built plans with mile post and offset dimensions. Make any corrections resulting from the Engineer's review, and resubmit as-built plans as a condition precedent to acceptance of the installation.

611-2.3.2 Components: As a minimum, identify all traffic control devices, poles, support structures, cabinets, pull and splice boxes, hubs, access points, and power services.

611-2.3.2.1 Conduit and Cable: Identify all conduit and cable with unique line styles for routing (overhead, conduit, saw cut, etc.) that are clearly identified in a legend on each sheet. Identify the type of cable (example - 7 conductor signal cable) and label the number of conductors, fiber strands or other identifying features of the cable. For conduit, clearly note conduit size and number of runs.

611-2.3.2.2 Loops and Detection Zones: Identify the location of all installed loops (including the distance from the stop bar for the advance loops), the path of each loop to the pull box, the loop window and the path of the loop lead-in to the controller cabinet. Identify the device location and the approximate detection area for detection systems that are not embedded in or under pavement.

611-2.3.2.3 Pull Boxes: Label unused and out of service pull boxes clearly. Show distances to each pull box from the nearest edgeline, stop bar, or other permanent feature. If an edgeline is not near a pull box or would not clearly identify its location; a fixed monument may be used (example - FDOT pole or structure).

611-2.3.2.4 Poles: Identify poles from the nearest edgeline of both approaches. If an edgeline is not near a pole or would not clearly identify its location, a fixed monument may be used.

611-2.3.2.5 Signal Heads: As-built plans must show the final location of signal heads. Each signal head shall be identified by its corresponding movement number.

611-2.3.2.6 Cabinet: The type of cabinet and inventory of internal components must be documented. Controller manufacturer along with the controller model number shall be submitted for all traffic signal cabinets. A cabinet corner "blow up" shall be submitted detailing pull box locations with all conduit and cable.

611-2.3.3 Compensation: All costs incurred in submitting as-built drawings are incidental to the other items of work associated with traffic control signals and devices.

611-2.4 Installation Inspection Requirements: Meet the requirements of Section 105.

611-3 Signal Timing.

Set the timing of a traffic signal or system of traffic control devices in accordance with the Contract Documents, unless approved otherwise in writing by the Engineer.

611-4 Field Tests of Installations.

Perform the following tests in the presence of the Engineer and, when applicable, a representative of the agency designated to accept maintenance responsibility.

Continuity: Test each signal head circuit, pedestrian detector circuit, vehicle detector loop circuit, and interconnect signal circuit for continuity.

Functional: Perform a functional test that demonstrates that each and every part of the installation functions as specified.

Induced Voltage on traffic signal connections: Measure the voltage between each signal head indication field terminal and the AC neutral circuit in the controller cabinet during the off (dark) state of each signal head indication. Ensure that the voltage does not exceed 2 $V_{AC, RMS}$. If this value is exceeded, take the following action to reduce the value to 2 $V_{AC, RMS}$:

1. Check for loose or broken connections in the signal head circuit from the controller cabinet to the signal heads.
2. If (1) above does not correct the problem, connect additional neutral circuits between the signal head and the controller cabinet.

Inductive Loop Assembly: An inductive loop assembly is defined as a loop plus the lead-in cable. Measure and record the series resistance of each inductive loop assembly. Ensure that the resistance does not exceed 10 Ω. Perform an insulation resistance megger test, at 500 V_{DC}, for each inductive loop assembly at the cabinet in which the inductive loop assembly is terminated. Do not connect the inductive loop assembly to the cabinet terminal strips during the test, except for the drain wire of a shielded lead-in cable. Insulation resistance is defined as the resistance between one wire of the lead-in cable and a ground rod or bussbar. Record the insulation resistance of each inductive loop assembly. Ensure that the resistance is equal to or greater than 100 MΩ.

Perform the 48 hour test only after achieving acceptable results from the other tests listed in 611-4.

48 Hour Test for Traffic Signal installations:

1. Before beginning the 48 hour test, place all new signal installations (no existing signals) in flash for 48 to 336 hours. The length of the flash period will be determined by the Engineer.
2. Continuously operate each new or modified traffic signal installation or system for not less than 48 hours. If unsatisfactory performance of the system develops, correct the condition, and repeat the test until obtaining 48 hours of satisfactory continuous operation.
3. During the 48 hour test period, the Contractor is fully responsible for the signal or signal systems. Provide a responsible representative (technically qualified) who can monitor signal operation and troubleshoot any malfunctions within a one hour period.

When coordination is specified in the Contract Documents, provide a two hour training session on the operation and programming of the coordination features of the controller units during the 48 hour test. Arrange the time and place of the training session with the Engineer.

4. Perform a 48 hour test for flashing beacon installations in the same manner as for traffic signal installations.
5. Start the 48 hour test on a Monday, Tuesday, or Wednesday. Ensure the 48 hour test does not include weekends, Holidays, or Special Events.
6. Start the 48 hour test between 9:00 AM and 2:00 PM.
7. Before the 48 hour test, install and have standing by all equipment specified in the Contract Documents.

611-5 Contractor's Warranty Period for Installations.

611-5.1 General Requirements: Repair or replace any defective components or work of the installations for a 90 day period after final acceptance.

611-5.2 Contractor's Responsibilities: During the warranty period, the Contractor is responsible for the following:

1. Repair or replacement of equipment that fails to function properly due to defective materials or workmanship.

2. Upon notification by the Engineer of a malfunction, restore the equipment to proper operating condition within 12 hours after notification by the Engineer.

If the Contractor fails to restore the equipment to proper operating condition within 12 hours after notification, the Engineer has the authority to have the remedial work performed by other forces. The Contractor is responsible for all incurred costs of the work performed by other forces. Remedial work performed by other forces does not alter any of the requirements, responsibilities or obligations of this warranty.

3. In the event that the equipment does not function or malfunctions due to defective materials or workmanship, the Contractor is liable for any impairment to the safety of pedestrian and vehicular traffic resulting from such malfunction.

611-5.3 Department's Responsibilities: During the warranty period, the Department is responsible for the following:

1. Electrical energy costs which are paid for by the local maintaining agency.
2. All adjustments, such as timing, necessary for the normal operations of equipment.
3. Documentation of the individuals involved and the time of Contractor notification upon failure or malfunction of equipment.
4. Repair or replacement of any part of the installation damaged as a result of natural causes or those resulting from vehicular or pedestrian traffic not associated with Contractor activities.

611-6 Manufacturer's Tests and Certifications.

For materials which may not require formal testing, the Engineer reserves the right to require certifications from the manufacturer of such equipment and material, to the effect that they meet all Specification requirements, and, in the event of questionable equipment or material, to require that such material or equipment be tested at no expense to the Department.

The Engineer reserves the right to withhold any payments which may be due; if the Engineer determines that the equipment does not meet the Specifications or evaluation criteria.

611-7 Contracts for Purchase of Equipment.

611-7.1 Acceptance Tests Required: For each unit of equipment furnished under purchase contracts (furnish only), the Engineer will perform the following tests:

1. Visual inspection within 5 days after delivery.
2. Operational tests which determine whether the equipment performs in accordance with the requirements of the Contract Documents. The Engineer will complete such tests within 15 days after delivery. If the equipment is listed on the Department's Approved Product List (APL), the Engineer may verify the APL Certification number in lieu of the operational tests.

611-7.2 Eligibility for Payment:

The Department will base payment for equipment furnished under purchase contracts on satisfactory completion of the visual inspection and operational tests required by 611-7.1.

Before any payment will be made for each functional group, deliver to the Engineer and receive from the Engineer acceptance of all units of each functional group of equipment required to be furnished by the Contract Documents. The Department will make separate payment for a staged delivery of each functional group of equipment only when staged delivery is specified in the Contract Documents.

611-7.3 Equipment Failing to Pass Acceptance Tests:

When any unit of equipment fails to pass the acceptance tests, correct the deficiencies (by repair or replacement), at no expense (including all freight costs) to the Department, to attain compliance. If the original Contract Time has expired, the Department will charge and continue to assess liquidated damages in accordance with 8-10 until final acceptance of the equipment. Upon compliance with such correction requirements, the Engineer will perform tests on the equipment as specified above and will determine their eligibility for payment.

The Department will not assess liquidated damages during the acceptance test period in 611-7.1. The Department will allow only one acceptance test exclusion with regard to liquidated damages assessment per lot of units required to be delivered.

SECTION 620
GROUNDING AND LIGHTNING PROTECTION

620-1 Description.

Furnish and install grounding and lightning protection to provide personnel and equipment protection against faults, surge currents and lightning transients. Provide a grounding and lightning protection system in accordance with the details shown in the Design Standards unless otherwise shown on the Plans.

620-2 Materials.

620-2.1 Ground Rods: Use ground rods meeting the requirements of UL 467 that are listed by an OSHA Nationally Recognized Testing Laboratory (NRTL). Ground rods must be made of copper-clad steel with a nominal diameter of 5/8 inches. Ground rod sections must be a minimum of eight feet in length and manufactured for the sole purpose of providing electrical grounding.

620-2.2 Ground Rod Assembly: Provide a ground rod assembly consisting of one or more ground rods coupled together, such that the total length of the assembly is a minimum of 20 feet, driven into the earth at a single point, without disrupting the electrical continuity of the assembly.

620-2.3 Ground Rod Array: Provide ground rod arrays, as required, consisting of two or more ground rod assemblies, bonded together and spaced a minimum of 40 feet apart.

620-2.4 Grounding Conductors: Use solid copper insulated (green) conductor for electrical or lightning protection ground from the system ground bus or barrier plates to the ground rod assembly. Size equipment grounding conductors according to NEC Section 250.122. Size grounding electrode conductors according to NEC Section 250.66.

620-2.5 Exothermic Grounding Bond: Make all connections to the ground rod assemblies using exothermic welds.

620-2.6 Air Terminals: Use air terminals that comply with UL 96A and NFPA 780 standards and are listed by a NRTL.

620-2.7 Surge Protective Devices (SPDs): Provide SPDs to protect electronics from lightning, transient voltage surges, and induced current.

Install SPDs on all power, data, video and any other conductive circuit. SPD requirements for lighting must meet the minimum requirements of Section 992 and the Design Standards. SPDs for traffic control devices, including intelligent transportation system (ITS) equipment, must be listed on the Department's Approved Product List (APL).

Provide primary and secondary surge protection on AC power at traffic control device field sites.

620-2.7.1 SPD for 120 Volt or 120/240 Volt Power: Install a SPD at the utility disconnect to the cabinet. Ensure that the SPD at the utility disconnect includes L-N, L-G, and N-G protection and has a maximum surge current rating of 50 kA per phase or greater. The SPD must meet the requirements of UL 1449, Third Edition and be listed by a NRTL.

Ensure an SPD is provided where the supply circuit enters the cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all electronic devices and connected in parallel with the AC supply. Ensure that the SPD in the cabinet includes L-N, L-G, and N-G protection and has a maximum surge current rating of 50 kA per

phase or greater. The SPD must meet the requirements of UL 1449, Third Edition and be listed by a NRTL.

Ensure that the SPD has a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status and also provides one set of normally open (NO)/normally closed (NC) Form C contacts for remote alarm monitoring. The enclosure for a SPD shall have a NEMA 4 rating.

620-2.7.2 SPD at Point of Use: Install a SPD at the point the ITS devices receive 120 volt power and connected in series with the circuits. Ensure that these devices comply with the minimum functional requirements shown in Table 1. Ensure that the units are rated at 15 or 20 amps load and are configured with receptacles.

Ensure that these units have internal fuse protection and provide common mode (L+N-G) protection.

620-2.7.3 SPDs for Low-Voltage Power, Control, Data and Signal Systems: Install a specialized SPD on all conductive circuits including, but not limited to, data communication cables, coaxial video cables, and low-voltage power cables. Ensure that these devices comply with the minimum functional requirements shown in Table 1 for all available modes (i.e. power L-N, N-G; L-G, data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

Table 1				
SPD Minimum Requirements				
Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
12 V_{DC}	15-20 volts	N/A	5kA per mode (8x20 µs)	<150 Vpk
24 V_{AC}	30-55 volts	N/A	5kA per mode (8x20 µs)	<175 Vpk
48 V_{DC}	60-85 volts	N/A	5kA per mode (8x20 µs)	<200 Vpk
120 V_{AC} at POU	150-200 volts	N/A	20kA per mode (8x20 µs)	<550 Vpk
Coaxial Composite Video	4-8 volts	N/A	10kA per mode (8x20 µs)	<65 Vpk (8x20 µs/1.2x50µs; 6kV, 3kA)
RS422/RS485	8-15 volts	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
T1	13-30 volts	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
Ethernet Data	7-12 volts	Up to 1 Gbps	1kA per mode (10x1000 µs)	<30 Vpk
POE	60-70 volts	Up to 1 Gbps	5kA per mode (8x20 µs	<200Vpk (100kHz 0.5µs; 6kV, 500A)

Ensure that SPDs meet the requirements of UL 497B or UL 497C, as applicable, and are listed by a NRTL.

620-2.7.4 Mechanical Specifications: Ensure equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number.

All parts must be made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal.

620-2.7.5 Environmental Specifications: Ensure that SPDs operate properly during and after being subjected to the temperature and humidity test described in NEMA TS 2, Section 2.2.7, and the vibration and shock tests described in NEMA TS 2, Sections 2.2.8., and 2.2.9.

620-2.7.6 Manufacturer's Warranty: Ensure that the SPD has a manufacturer's warranty covering failures for a minimum of 10 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

The term "failure" for warranty replacement is defined as follows:

Parallel-connected, power-rated SPD units are considered in failure mode when any of the visual indicators shows failure mode when power is applied to the terminals at the unit's rated voltage, or the properly functioning over-current protective device will not reset after tripping.

Series-connected, low-voltage power, data, or signal units are considered in the failure mode when an open circuit condition is created and no data/signal will pass through the SPD device or a signal lead is permanently connected to ground.

In the event that the SPD, including any component of the unit, should fail during the warranty period, the entire SPD shall be replaced by the manufacturer at no cost to the Department or maintaining agency.

620-3 Installation.

620-3.1 General: Construct a single-point grounding system. Install the primary ground rod assembly in an electrical pull box so that the top four inches are accessible for inspection, resistance testing, and maintenance. The primary ground rod assembly and electrical pull box shall be installed between 12 inches to 36 inches from the element being grounded. The top of all other ground rod assemblies connected to the primary ground rod assembly in an array must be buried a minimum of 18 inches below grade. Direct bury grounding conductors used to connect ground rod assemblies a minimum of 18 inches below finished grade.

Bond all ground rod assemblies and ground rod arrays together with solid bare tinned copper wire unless otherwise shown on the Plans. Install grounding conductors in a straight path.

Make all bonds between ground wires and ground rod assemblies and ground rod arrays with an exothermic bond with the following exception: do not exothermically bond sections of ground rods to create the ground rod assembly and do not exothermically bond connections within a cabinet. Apply an anti-oxidant compound to all mechanical connections.

Connect primary surge protection for power at the service entrance or main disconnect. Connect secondary surge protection at point of use, unless otherwise shown on the Plans.

Ensure that lightning protection systems conform to the requirements of the National Fire Protection Association (NFPA) Code NFPA 780, Standard for the Installation of

Lightning Protection Systems. Install SPDs that have an operating voltage appropriate for the characteristics of the circuits they protect. The NFPA requirements do not apply to lighting systems.

620-3.2 Minimum Grounding Resistance: Obtain a resistance to ground of 5 ohms or less for the following elements. Install multiple ground rod assemblies totaling a maximum length of up to 80 feet, as required to achieve minimum grounding resistance.

1. Power service for traffic control devices
2. Signal and ITS cabinets
3. ITS Poles/Structures with electronic equipment
4. DMS and DMS structures

Install a minimum of one primary ground rod assembly. If a grounding and lightning protection system using a single ground rod assembly does not achieve the required resistance to ground, extend the length of the ground rod assembly an additional 20 feet or install an additional ground rod assembly 40 feet away and connect it to the main ground rod assembly to create a ground rod array. Continue installing ground rod assemblies connected in an array until the required resistance is obtained or until the maximum required total length of ground rod is installed.

Grounding systems formed from horizontally constructed conductive radials are permitted if site conditions prohibit the use of vertically driven rods as permitted by the NEC Article 250.53(G). A grounding system consisting of the maximum total length of ground rod required is acceptable in cases where soil conditions prevent the grounding system from achieving the required resistance to ground. Submit the site resistance measurement to the Engineer.

Install a single ground rod assembly for these elements.

1. Conventional lighting
2. External lighting for signs
3. Signal cable & span wire
4. Aerial interconnect messenger wire
5. Pedestals for pedestrian signals
6. Pull boxes with metal covers when 120 volts (or greater) AC power is present
7. Splice vaults with wire grounding units.

620-3.3 Grounding Traffic Control Systems at Signalized Intersections: Ensure that all separately grounded elements at an intersection (signal cabinet, power service, mast arms or strain poles, etc.) are bonded together to form an intersection grounding network array.

For traffic signal poles, including pedestals for pedestrian signals, accommodate the ground connection from signal heads and electrically powered signs through span wires to the ground rod assembly or array located at the pole base in accordance with the details in the Design Standards.

For span wire assemblies, use the span wire to connect the ground rod assemblies or arrays of the poles. Do not use guy wires for grounding purposes, however bond any guy wire to the span wire as part of the intersection grounding network.

620-3.4 Grounding Traffic Control Systems on Highways: Install the primary ground rod assembly at the base of the traffic control device supporting structure. Bond all metal components of the system (such as cabinets, steel poles, and concrete pole grounding wire) to the

grounding system using a mechanical connection on the equipment side and an exothermically welded connection at the down cable. Do not use split bolts for grounding system connections.

Connect all ground rod assemblies and any associated grounded electrical system within a 100 foot radius (but not beyond the edge of the roadway) of the primary ground rod assembly. Connect the primary ground rod assembly to a single point main grounding bar inside the equipment cabinet or mount it to the base of the traffic control device supporting structure unless otherwise shown on the Plans.

Place multiple ground rod assemblies, as required, in a ground rod array as depicted in the Design Standards unless otherwise shown on the Plans. If a required array cannot be placed in the right of way, submit an alternate placement detail for approval.

620-3.5 Grounding Highway Lighting Systems: Ground each metal light pole.

For poles on bridge structures, bring the grounding conductors out to a pull box at each end of the structure and connect them to driven ground rods 20 feet in length.

Ground all high mast poles in accordance with the details for grounding in the Design Standards, Index No. 17502.

620-3.6 Grounding Equipment Shelters: Install all grounds for the equipment shelter on the side of the building that utilities, communication cables, and fiber enter. Connect all earth grounds to this point, including the grounding system for SPDs. Make all connections to SPDs according to the manufacturer's recommendations.

Ensure that communication cables, AC power, emergency generator, and equipment frames are connected by the shortest practical route to the grounding system. Protect the lead lengths from each device to the SPD.

Use compression type connection for all interior connections to bond grounding conductors to equipment in the shelter. For connections to bus bars, use mechanical connections having two bolts on a double-lug connector. Install star washers, or another means that accommodates the fasteners used and achieves reliable electrical connections that will not deteriorate. Crimp and solder all wires connected to lugs or clamps. Verify electrical continuity of all connections. Remove all non-conducting surface coatings before each connection is made.

Ensure that ground conductors are downward coursing, vertical, and as short and straight as possible. Ensure that the minimum bending radius for interior equipment shelter grounds is eight inches. Avoid sharp bends and multiple bends in grounding conductors.

620-3.6.1 Interior Grounding: Install a No. 2 AWG solid bare copper wire approximately one foot below the ceiling on each wall and mount it using insulated standoffs. Ensure that the wire encircles the equipment room, forming a ring or continuous loop. Mechanically connect the cable trays to the interior perimeter ground using stranded copper wires with green insulation and bolted terminal connectors at the cable tray ends. Make all points where cable tray sections meet electrically continuous by use of a short jumper wire with terminals attached at each end.

Directly bond all other metallic objects, such as door frames and doors, air conditioners, alarm systems, wall-mounted communication equipment, etc., to the closest interior perimeter ground with the shortest possible stranded copper wire with green insulation. Bond the door to the doorframe using flexible welding cable.

620-3.6.2 Exterior Grounding: Install an exterior grounding system consisting of multiple ground rod assemblies around the exterior perimeter of the equipment shelter. Place the ground rod assemblies a minimum of two feet from the building foundation in a suitable access point. Bond the following items to the shelter's grounding system:

1. Metal building parts such as downspouts and siding.
2. Ground rods provided by power or telephone utilities for grounding of AC power or surge protection devices, as permitted by local codes.
3. Shelter support skids, bases, or foundations, if applicable.
4. Any metal object larger than four square feet.
5. External metal fencing.

620-3.6.3 Punch Block SPD Grounding: Ground Type 66 punchdown blocks in accordance with the manufacturer's recommendations and mechanically connect them to the shelter's interior perimeter ground.

620-3.6.4. Equipment Shelter Fence Grounding: Ensure that the metal Type B fence is grounded to fence perimeter grounding conductors consisting of No. 2 AWG solid bare tinned copper wires that encircle the entire compound to achieve required resistance to ground required in 620-3.2.

Exothermically bond any splices in the grounding conductors. Bury the fence perimeter grounding conductor a minimum of 2.5 feet below finished grade. Bond all fence posts to the fence perimeter ground wire using No. 2 AWG solid bare tinned copper wire. Bond the gate and gatepost together with a flexible ground, such as welding cable wires. Ground the gatepost to the fence perimeter ground wire using No. 2 AWG solid bare tinned copper wire. Exothermically bond all connections to the fence perimeter ground wire.

Connect the fence's top rail to each corner post and in the middle of each side. Ground the fence fabric with No. 2 AWG solid bare tinned copper wire connected to the fence posts. Connect the fence perimeter wires to the ground rod assemblies of the equipment shelter's ground system with No. 2 AWG solid bare tinned copper wire, as shown on the Plans.

Ensure that all ground leads are No. 2 AWG solid bare tinned copper wires for all above- and underground grounding wire installations. Ensure that all exothermic bonds are appropriate for the application. Do not use welding or other forms of bonding without prior written approval.

620-4 Ground Resistance Testing and Inspection.

620-4.1 Testing: Measure the ground resistance with an instrument designed specifically to measure and document earth/ground resistance, soil resistivity, and current flow. Conduct the test by using the fall-of-potential method as described in the Institute of Electronic and Electrical Engineers (IEEE) Standard 81.If fall-of-potential tests cannot be performed, it is acceptable to measure resistance at each accessible ground rod using a clamp-on ground resistance tester. Submit to the Engineer certified test results for each testing location. Submit the following information on the test results:

1. The formal name or ID for the location where the test was performed
2. The GPS latitude and longitude for the location where the test was performed
3. The date on which the test was performed
4. The make and model number, serial number, and last date of calibration (by an independent testing facility within the previous 12 months) for the grounding resistance testing device used
5. Contact information (including name, signature, and employer name) for each person conducting, witnessing, or certifying the test
6. Description of the local environmental and soil conditions at the time of testing

7. A rough sketch of the site grounding system; along with the corresponding measured data points

8. Page numbering showing the current page number and total page count (e.g., Page 1 of 3)

620-4.2 Inspection: Do not backfill below-grade grounding installations and grounding connections until inspected and approved. The Engineer will inspect the installation for proper connection types, tightness, workmanship, and conformance to Plans. Replace any exothermic bonds that are deemed unsatisfactory with new exothermic bonds. Repair or replace any mechanical connections that are deemed unsatisfactory. Measure the resistance at each accessible ground rod using a clamp-on earth tester. The measurement at any individual rod is the cumulative resistance of all rods in a parallel circuit.

For grounding system inspections, notify the Engineer at least five days prior to completion of the installation. Record all test results in a standardized format approved by the Engineer prior to testing. All recorded test report data shall be dated, witnessed, and signed by at least one representative of the Department and the Contractor. Remedy all deficiencies at no cost to the Department.

620-5 Basis of Payment.

The work specified in this Section will not be paid for directly, but will be considered as incidental work.

SECTION 630
CONDUIT

630-1 Description.

Furnish and install conduit for traffic control signals and devices, highway lighting, and other electrically powered or operated devices as shown in the Contract Documents.

630-2 Materials.

630-2.1 Conduit: Use materials that have been tested and listed by a Nationally Recognized Testing Laboratory to the following industry standards:

Schedule 40 and 80 Polyvinyl Chloride (PVC)[1]..... UL 651
Fiberglass Reinforced Epoxy[2]..... UL 2420
Intermediate Metal[3]..... UL 1242
Rigid Galvanized Metal[3,4]..... UL 6
Rigid Aluminum[4]..... UL 6A
PVC Coated Intermediate Metal[4]..... ASTM A135/A135M,
..... ASTM A513, ASTM A568/A568M, NEMA RN1-2005
Liquid Tight Flexible Metal..... UL 360
High Density Polyethylene (HDPE) Standard Dimension
Ratio (SDR) 9-11[5]..... ASTM F2160
HDPE SDR 13.5[5]..... ASTM F2160, NEMA TC-7
Schedule 40 and 80 HDPE..... UL 651A

1. Use conduit with solvent weld slip-fit plastic couplings unless approved by the Engineer.
2. Use conduit having a minimum stiffness value of 250. Ensure that each section has a duct bell with an integral gasket on one end and a duct spigot on the other end.
3. Use conduit that is hot-dipped galvanized with a minimum coating of 1.24 ounces per square foot on both the inside and outside of the conduit. The weight of the zinc coating shall be determined using ASTM A90.
4. Use conduit with both ends reamed and threaded.
5. Can be used with preassembled cable and rope-in-conduit.

630-2.2 Locate Wire: Ensure that locate wire is a single copper conductor with a minimum gauge of No. 12 AWG. Ensure locate wire is insulated using a 45 mil minimum thickness polyethylene sheath that is orange in color and marked to identify the manufacturer and the conductor size.

630-2.3 Locate Wire Grounding Unit: Ensure that locate wires are attached to a wire grounding unit (WGU) dedicated to safely dissipate high transient voltages or other foreign electrical surges induced into the designated system. Ensure the WGU conforms to the following:

1. Allows signals generated by locate system transmitters to pass through the protection system without going to ground.
2. The protection system automatically resets and passes locate system transmitter signals after the unit has been grounded to dissipate over-voltages.
3. Is intended for below or above grade applications. Ground the WGU to a driven rod within 10 feet of the system using a No. 6 AWG single conductor wire with green insulation.

Ensure that the WGU is enclosed for protection from environmental hazards and is accessible for the connection of portable locate system transmitters.

4. The WGU system meets the minimum standards listed in Table 1 for surge protection:

Table 1: Minimum Standards for Surge Protection	
Surge Element	3-element maximum duty fail-safe gas tube.
Rating	40,000 A surge capacity (single-cycle, 8 by 20 microsecond waveform).
Life	Minimum 1,000 surges (1000 A to ground).
Fail-Safe	Integral fail-shorted device.
Insulation Resistance	1,000 megohm minimum at 100 volts of direct current (V_{DC}).
Clamp Voltages	a. Impulse at 100 volts per microsecond: Typically 500 volts. b. Direct Current: 300 to 500 volts.

630-2.4 Warning Tape: Ensure that the buried cable warning tape is flexible, elastic material 3 inches wide, 6 mil thick, intended for burial and use as an underground utility warning notice, and that the surface of the warning tape is coated and sealed to prevent deterioration caused by harsh soil elements. Ensure that the warning tape color follows the American Public Works Association color code for underground utilities and has the repeating message "CAUTION: FDOT CABLE," or other wording approved by the Engineer, permanently printed on its surface. Ensure that the tape material and ink colors do not change when exposed to acids, alkalis, and other destructive chemical variances commonly found in Florida soils.

630-2.5 Route Markers: Route markers may be either a standard route marker (SRM) type or an electronic route marker (ERM) type. Ensure the SRM is a rigid, tubular, driven post used for location and notification purposes only. Ensure the ERM is physically identical to the SRM, but also includes a termination board to provide aboveground access to locate wire buried alongside conduit and cable runs.

Ensure that each SRM is labeled and identified as an FDOT fiber optic cable marker unless otherwise shown in the Plans. The labels must include the Department's logo, contact information for the local FDOT District, and a telephone number to call prior to any excavation in the area. Ensure that the identification information is permanently imprinted on the top fitting, and will not peel, fade, or deteriorate.

630-2.5.1 Standard Route Marker (SRM): Ensure that SRM posts are white with an orange top fitting cover with black or white lettering and graphics. Ensure that the SRM is a tubular configuration, and both the marker post and the top fitting are made from virgin Type 111 HDPE. Ensure that any fasteners used with the SRM are constructed of stainless steel.

Ensure that all SRMs have a minimum outside diameter of 3.5 inches with a minimum wall thickness of 0.125 inches. Ensure that the top fitting cover is a minimum of 1.5 feet long and has an outside diameter of 3.75 inches with a minimum wall thickness of 0.125 inches. Ensure that each SRM provides a tensile strength of 4,200 pounds per square inch as required in ASTM D638. Ensure that each SRM is manufactured for use in temperatures range of minus 30° to 165°F in accordance with NEMA TS 2.

Ensure the SRM can withstand an impact force of 70 pounds per foot at 32°F in accordance with ASTM D2444, before and after UV conditioning for 2,000 hours in accordance with ASTM G154. Ensure that the control sample of any material tested maintains a minimum of 70 percent of its original tensile strength.

Ensure that SRMs installed at the minimum 2 foot depth can withstand at least one impact at 45 miles per hour by a vehicle weighing at least 3,500 pounds and that after impact, post returns to an upright position within 10 degrees of vertical alignment within 30 seconds from the time of impact.

630-2.5.2 Electronic Route Marker (ERM): Ensure ERMs meet the same material and performance requirements as the SRMs with the following exceptions. Equip each ERM with a removable, top-fitting cover that is black with white lettering. Ensure that each ERM contains a terminal board equipped with locate wire and ground connectors.

Ensure that the terminal board is made from corrosion-resistant materials and includes terminal facilities labeled according to function and provides uniform spacing between connection points.

630-3 Installation Requirements.

630-3.1 General: Install the conduit in accordance with NEC or National Electrical Safety Code (NESC) requirements and the Design Standards. Consider the locations of conduit as shown in the Plans as approximate. Construct conduit runs as straight as possible, and obtain the Engineer's approval for all major deviations in conduit locations from those shown in the Plans. Include buried cable warning tape with all trenched conduit. Mark the location of the conduit system with route markers as shown in the Plans and approved by the Engineer. Ensure that all route markers used are new and consistent in appearance.

For conduit installed by directional bore, install in accordance with Section 555. For conduit installed by jack and bore, install in accordance with Section 556.

Use only intermediate metal conduit, rigid galvanized metal conduit, rigid aluminum conduit or PVC coated intermediate metal conduit for above-ground electrical power service installations and rigid galvanized metal conduit or rigid aluminum conduit for underground electrical power service installations. Meet the requirements of Section 562 for coating all field cut and threaded galvanized pipe.

Use Schedule 80 PVC or fiberglass reinforced epoxy conduit in structural elements in or on bridge decks.

Use HDPE with an SDR number less than or equal to 11, Schedule 80 PVC or Schedule 40 PVC for underground installations in earth or concrete for ITS and traffic control signal applications, except, use only HDPE with an SDR number less than or equal to 11 for blown fiber optic cable installations on limited access facilities.

Use HDPE with an SDR number less than or equal to 13.5, Schedule 80 PVC, or Schedule 40 PVC for underground installations of electrical conduit in earth for lighting applications and landscape irrigation applications.

Use HDPE with an SDR number less than or equal to 13.5, Schedule 80 PVC, Schedule 40 PVC, or rigid galvanized metal for underground installations of electrical conduit in concrete for lighting applications.

Do not place more than the equivalent of three quarter bends or 270 degrees of bends, including the termination bends, between the two points of termination in the conduit, without a pull box. Obtain the Engineer's approval to use corrugated flexible conduits for short runs of 6 feet or less.

When a conduit installation changes from underground to above-ground, make the change a minimum of 6 inches below finished grade.

Install a No. 12 AWG pull wire or polypropylene cord inside the full length of all conduits. Ensure that a minimum of 24 inches of pull wire/cord is accessible at each conduit termination.

Ensure the conduit includes all required fittings and incidentals necessary to construct a complete installation.

When earth backfill and tamping is required, place backfill material as per Section 120 in layers approximately 12 inches thick, and tamp each layer to a density equal to or greater than the adjacent soil.

When backfilling trenches in existing pavement, use a flowable fill meeting the requirements of Section 121.

Provide a standard clearance between underground control cable and electrical service cable or another parallel underground electrical service cable that meets NESC requirements.

Prevent the ingress of water, dirt, sand, and other foreign materials into the conduit prior to, during, and after construction. Seal the ends of conduit after wiring is complete with a moisture resistant sealant that is designed for this specific application.

630-3.1.1 Fiber Optic Cable Conduit: Install the conduit system so the fiber optic cable maintains a minimum bend radius of 20 times the cable diameter. Use approved methods for connecting inner duct or conduit within or between plowed portions, trenched portions, and bored portions. Submit the conduit manufacturer's coupling method and material to the Engineer for approval.

630-3.2 Conduit Sizes: Size the conduit to be used on all installations, unless otherwise shown in the Contract Documents. Use conduit of sufficient size to allow the conductor to be installed without any damage and meeting NEC requirements. Use conduit that is at least 2 inches in diameter, with the following exceptions:

For conduit protecting the ground wire on the side of a pole, use conduit that is at least 1/2 inch in diameter.

For ITS applications where Contractor chooses to install fiber optic cable by blowing, use conduit that is at least 1-1/4 inch in diameter.

For traffic control signal and device electrical service conduit, use the minimum conduit size required by the local maintaining agency and the electrical service provider.

630-3.3 Conduit Joints: Make conduit joints using materials as specified by the manufacturer. When conduit crosses an expansion joint of a structure and where shown in the Plans, install an expansion or expansion/deflection fitting as specified by the manufacturer. Certify that expansion/deflection fittings are rated to accommodate a minimum rotation of 30 degrees and that both the expansion and expansion/deflection fittings are rated to accommodate the anticipated longitudinal movement (minimum of 2 inches for deflection fittings and 0.7 inches for expansion/deflection fittings). Ensure that all installed joints are waterproof. As an exception to the threaded coupling for intermediate metal conduit, at locations where it is not possible to screw the threaded coupling properly, the Contractor may use a waterproof slip-joint coupling approved by the Engineer. Secure the joint, and tighten threaded connections.

Prior to insertion into the coupling, clean, prime and coat the ends of PVC conduit with solvent-type cement as specified by the manufacturer.

630-3.4 PVC Coating: Apply PVC coating to exposed metal surfaces of the conduit, except for the threads, to attain a nominal thickness of 40 mils. Ensure that the coating is free of sags and drips.

Attach the coupling to the conduit prior to the application of the coating for conduit of 1 inch diameter or less.

Use a coupling with sleeve extensions on conduit larger than 1 inch. Ensure that the sleeve extensions on all threaded female openings have a length equal to the diameter of the conduit up to and including size number 53.

630-3.5 Conduit Terminations: Fit the terminating ends of all metal conduit and metal conduit sleeves with an appropriate bushing.

For conduit to be encased in concrete, wrap with tape or otherwise protect all terminations to prevent the entrance of concrete.

Connect new underground conduits to existing underground conduits with a pull box.

Install conduit terminating in a concrete strain pole through the cable entry hole and up the center of the pole to a location approximately 6 inches below the handhole.

Seal conduits terminating in a controller base, pole, pull box, junction box, or pedestal base with a moisture resistant sealant approved by the Engineer.

For a controller base, pole or pedestal base, and junction boxes, terminate conduit runs into the center of the base or box at least 2 inches above the surface of the base.

630-3.6 Restoration of Trench Areas: Restore the conduit trench construction area to an acceptable condition. Such work includes repair or replacement of all pavement areas, sidewalks, driveways, curbs, structures, landscaping, grass areas (including removal of excavated materials and spoils), removal and disposal of drilling fluids, and backfilling areas disturbed by the conduit installation.

630-3.7 Above-Ground Installation: Use conduit designed and manufactured for use in long-term above-ground applications with UV stabilization to prevent material deterioration. Securely attach above-ground conduit installations to the surface of the supporting structure using conduit straps. As a minimum, use conduit straps located on 5 foot centers. Use galvanized metal conduit straps when installing intermediate metal conduit, fiberglass reinforced epoxy conduit, rigid galvanized conduit, rigid aluminum conduit or PVC coated intermediate metal conduit above ground.

Use the same PVC coating for the metal straps as the conduit, when using PVC coated intermediate metal conduit.

630-3.8 Elbows: The radius of curvature of the centerline of any bend shall not be less than shown below:

Size	Standard Radius
1/2 inch	4 inches
3/4 inch	4-1/2 inches
1 inch	5-1/2 inches
1-1/4 inches	7-1/4 inches
1-1/2 inches	8-1/4 inches
2 inches	9-1/2 inches
2-1/2 inches	10-1/2 inches
3 inches	13 inches

Size	Standard Radius
3-1/2 inches	15 inches
4 inches	16 inches
5 inches	24 inches
6 inches	30 inches

630-3.9 Fiber Optic Cable Locate Wire: Install locate wire in the trench or bore with all underground conduits to provide end-to-end electrical continuity for electronically locating the underground conduit system. Bury locate wire along the centerline of the top outer surface of installed conduit. Do not install locate wire in a conduit with fiber optic cable.

Do not run locate wires into field cabinets. Terminate locate wires at the first and last pull boxes in the conduit run or as shown in the Plans. Ensure that wire termination occurs in a pull box as shown in the Design Standards, Index No. 17700.

In a trenching operation, install the locate wire no more than 3 inches above the conduit. Ensure that the locate wire enters all pull and splice boxes, and that a minimum of 10 feet of slack locate wire is coiled and neatly stored in each box.

In a boring operation, install the locate wire in an encasement, install the conduit detection wire external to the conduit with no separation between conduit and wire, or use conduit with integral locate wire. Locate wire may also be placed in the void between the inner wall of conduit and innerducts contained within the conduit as long as no other cables are present within the void.

Perform continuity tests and insulation resistance tests on all locate wires and provide the Engineer with all test results. Replace, or repair defective locate wire at no additional cost.

Make locate wire splices in a flush grade-level box. Ensure that locate wire splices are waterproof and suitable for direct burial. Ensure that locate wire splices at the pull box meet NEC requirements. Ensure that locate wire splices are constructed of and in the following order: a mechanical crimp connection with a butt sleeve, an oxide-preventing aerosol lacquer, mastic electrical splicing tape, and standard electrical tape. At the completion of the installation, provide the Engineer with as-built drawings that document all splice locations.

Install WGUs in pull boxes and splice boxes as shown in the Plans or directed by the Engineer. Mount the device in a location high enough from the bottom of the box to allow access to terminal facilities without disturbing cables present within the box. Terminate the locate wires and connect the WGU to ground in accordance with the manufacturer's instructions.

Test the locate wire system after installation to ensure that it functions and can be used to accurately locate the conduit system.

630-3.10 Route Markers: Install route markers for fiber optic cable installations and ensure the following:

1. Markers are plumb and level and the notification information is clearly visible when viewed from the side facing the roadway.
2. Markers are set within the right of way.
3. Markers are placed at a 1 foot offset from the conduit system.
4. The top of the marker post is a minimum of 5 feet and maximum of 6 feet above the finish grade
5. Markers are spaced a maximum of 500 feet apart.
6. A clear line of sight is maintained from one marker to the next.

7. Markers are installed on both sides of the roadway at any crossing point where the conduit system changes to the opposite side of the roadway.

8. Markers are installed at the center point of any conduit run between two pull or splice boxes.

9. Markers are installed at gate locations when the conduit system is adjacent to a fence line.

10. Markers are installed on both sides of a stream, river, or other water crossing, and on both sides of aboveground attachments such as bridges and walls.

Remove and replace all marker posts damaged during installation at no additional cost. Ensure that route marker signs are labeled with a unique identification number, as detailed in the Plans or as approved by the Engineer. Provide as-built documentation at the completion of installation that includes identification number and location of all installed route markers and correlates the marker to the fiber optic infrastructure that it signifies.

Ensure that installation of ERMs includes connection of the route marker to the locate wire associated with the conduit run that the markers identify. Install locate wire through the base of the marker and terminate the locate wires to connectors mounted on the terminal board inside the marker. Install an underground magnesium anode a minimum of 10 feet away from the marker and perpendicular to the conduit system. Terminate the anode lead on the connector mounted on the terminal board inside the marker. Install the bond straps between the anode connector and all locate wire connectors to provide cathodic protection for the locate wire conductor.

630-4 Method of Measurement.

630-4.1 General: Measurement for payment will be in accordance with the following work tasks.

630-4.2 Furnish and Install: The Contract unit price per foot of conduit, furnished and installed, will include furnishing all hardware and materials and all testing as specified in this Section and the Contract Documents, and all labor, casings, removal of excavated materials and spoils, removal and disposal of drilling fluids, locate wire, trenching, boring, backfilling, flowable fill and restoration materials necessary for a complete and accepted installation.

Payment for conduit placed underground will be based on the horizontal length of the trench or bore measured in a straight line between the centers of pull boxes, cabinets, poles, etc., in linear feet, regardless of the length or number of conduits installed. No allowance will be made for sweeps or vertical distances below the ground.

Payment for conduit placed aboveground or bridge mounted will be based on the actual length of conduit installed.

630-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment for conduit placed under existing turf will be made as open trench.

Payment for conduit placed under existing pavement (roadway, driveways, or sidewalk) will be made as directional bore. If conduit is being placed under both existing turf and existing pavement between two pull boxes, payment for the total pull box-to-pull box length will be made as directional bore. Payment for conduit placed by jack & bore will be made as jack & bore, for the total pull box to pull box length.

No additional payment will be made for multiple conduits in the same trench.

No payment adjustment will be made if the Contractor chooses to use an alternative method approved by the Engineer.

No payment will be made for failed bore paths, injection of excavatable flowable fill, products taken out of service, or incomplete installations.

Payment will be made under:

Item No. 630- 2- Conduit – per foot.

SECTION 632
SIGNAL CABLE

632-1 Description.

Furnish and install underground and aerial signal cable as shown in the Plans and in accordance with Design Standards, Index No. 17727.

632-2 Materials.

Use only new materials meeting the requirements of this Section.

632-2.1 Signal Cable: Use either polyethylene insulated, polyvinyl chloride jacketed signal cable conforming to the requirements of the International Municipal Signal Association, Inc. (IMSA) Specification No. 19-1 or polyethylene insulated, polyethylene jacketed signal cable conforming to the requirements of IMSA Specification No. 20-1. Use signal cable conductors of stranded copper, No. 14 AWG or larger.

632-2.2 Cable Support Wire: Provide utilities grade zinc-coated support wire meeting the requirements of ASTM A475, whether separate or integral to signal cable, having a minimum nominal diameter of 1/4 inches.

632-2.3 Cable Attachment Hardware: Ensure that all bolts and nuts less tha5/8 inch in diameter are passivated stainless steel, Type 316 or Type 304 and meet the requirements of ASTM F593 and ASTM F594 for corrosion resistance. Ensure that all bolts and nuts 5/8 inch and over in diameter are galvanized and meet the requirements of ASTM A307. Use attachment hardware with sufficient tensile strength for the application. Use stainless steel lashing wire, galvanized or stainless steel lashing rod, cable rings or self-locking cable ties of UV stabilized black plastic having a minimum tensile strength of 100 pounds.

632-3 Installation Requirements.

Except for mast arm assemblies, install signal cable in continuous lengths between the traffic signal controller cabinet and the first disconnect hanger (or traffic signal head) on the span and between the traffic signal controller cabinet and each pedestrian signal head and pedestrian detector.

Do not use the neutral return conductor for pedestrian detectors as a neutral return for any other device. Conductors for the pedestrian signal head and the push button must be separated at the base of the pedestal and routed to the detection panel using separate raceways.

632-3.1 Number of Conductors: Determine the number of conductors required for each signal cable unless specified in the Contract Documents.

Provide three spare conductors for each signal cable used at all signal installations. Install the three spare conductors from the controller cabinet through each disconnect hanger (or traffic signal head) to the furthermost disconnect hanger (or traffic signal head).

Identify all spare conductors in a controller cabinet and ground them to the controller cabinet ground bus bar. Provide spare conductors within the controller cabinet of sufficient length to reach the furthermost field wiring terminals in the cabinet.

632-3.2Protection of Cable: Ensure cable drawn through conduit, ducts, drilled holes protected by a rubber grommet, or support structures is installed in such a manner as to prevent damage to conductors or insulation.

632-3.3 Cabling for Mast Arm Assembly: Continuous lengths of cable between the traffic signal controller cabinet, signal heads (or disconnect hangers), pedestrian signal heads and pedestrian detectors will be allowed only when specified in Contract Documents.

632-3.4 Cable Terminations: Terminate signal cable in the terminal by inserting the bared conductors into a compression type terminal block.

When barrier terminal blocks are specified in the Contract Documents, crimp insulated fork or ring terminals to the bared conductors using a calibrated ratchet-crimping tool and connect the forks or ring terminals to the barrier terminal block.

Neatly form and tie wrap all cable terminations.

If disconnect hangers are specified in the Contract Documents, terminate spare wires at the terminal strip located inside the disconnect hangers. Individually cap or tape any additional spares in the disconnect hanger.

Connect signal cables for a mast arm assembly in the terminal compartment when provided.

632-4 Method of Measurement.

The Contract unit price for signal cable, furnished and installed, will include furnishing all material, hardware, support wire, cable ties, cable clamps, lashing wire, terminal connectors, cable grounding and labor necessary for a complete and accepted installation.

For intersections where new strain poles, monotubes, or mast arms are installed, payment for signal cable will be based on the number of intersections at which signal cable is furnished and installed.

For all other applications, including repair and replacement of signal cable, payment for signal cable will be based on the linear feet of cable used.

632-5 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 632- 7- Signal Cable

SECTION 635
PULL, SPLICE, AND JUNCTION BOXES

635-1 Description.

Furnish and install pull, splice, and junction boxes as shown in the Plans.

635-2 Materials.

635-2.1 General: Use pull and splice boxes listed on the Department's Approved Product List (APL).

635-2.2 Pull and Splice Boxes:

635-2.2.1 General: Manufacturers of concrete pull and splice boxes and covers seeking inclusion on the APL shall meet the requirements of Section 105 and this Section and be listed on the Department's Production Facility Listing.

Ensure box bodies and covers are free of flaws such as cracks, sharp, broken, or uneven edges, and voids.

Ensure in-ground boxes have an open bottom design.

635-2.2.2 Marking: Ensure the following information is permanently cast into the top surface of all pull and splice box covers:

1. Unless otherwise shown in the Plans, mark application as follows:

   FDOT TRAFFIC SIGNAL for signalized intersections
   FDOT FIBER OPTIC CABLE for fiber optic cable
   FDOT LIGHTING for highway lighting
   FDOT TRAFFIC MONITORING for traffic monitoring
   FDOT ELECTRICAL for other electrical applications

2. Manufacturer's name or logo
3. FDOT APL approval number
4. TIER rating

Ensure the date of manufacture (month/day/year, or date code) is permanently located on the top or bottom of the cover. Ensure the interior of the box body has a permanent marking that includes the manufacturer part/model number and date of manufacture near the top of box in a location that is visible after installation when the cover is removed.

635-2.2.3 Dimensions: Unless otherwise shown in the Plans, provide pull and splice boxes with the following dimensions.

For signalized intersection and lighting applications, provide pull boxes with nominal cover dimensions of 13 inches wide by 24 inches long or larger and no less than 12 inches deep. Ensure the inside opening area is a minimum of 240 square inches and no inside dimension is less than 12 inches.

For fiber optic cable applications, provide pull boxes with nominal cover dimensions of 24 inches wide by 36 inches long or larger and no less than 24 inches deep.

Provide rectangular splice boxes with nominal cover dimensions of 30 inches wide by 60 inches long or larger and no less than 36 inches deep. Provide round splice boxes with a nominal cover diameter of 36 inches or larger and no less than 36 inches deep.

635-2.2.4 Fabrication: Provide box covers constructed of concrete, polymer concrete or other materials meeting the requirements of this Section.

Provide box covers with lifting slots and a flush-seating lockdown mechanism. Use penta-head lockdown lag bolts. Ensure lockdown bolts and lifting slots are Type 316, 304, or 302 passivated stainless steel or brass. Ensure lockdown bolt assembly is designed to prevent seizing and can be removed without damaging the cover or box body. Ensure the lockdown bolt threaded insert/nut assembly is field replaceable.

635-2.2.5 Testing Requirements: Ensure pull and splice boxes meet the American National Standards Institute/Society of Cable Telecommunications Engineers (ANSI/SCTE) 77 2013 Specification for Underground Enclosure Integrity for TIER 15 loading with the following additional clarifications and requirements:

1. Apply all environmental tests to the box and its cover.
2. All flexural testing must be conducted in accordance with an appropriate ASTM standard and clearly stated in the report.
3. Perform repetitions of Cycle 1 in Table X2.1 of ASTM G154 for a minimum duration of 1000 hours for the simulated sunlight exposure test.
4. Use deflection-measuring devices positioned to measure vertical and lateral deflection (wherever maximum deflection occurs) for the vertical sidewall load test.
5. Conduct the lateral sidewall pressure, vertical sidewall load and cover vertical load tests without any removable or permanent wall to wall supporting beams located in the interior or top of the box opening.

When testing pull and splice boxes of various sizes (width x length x depth), the cover impact test, internal equipment protection test, coefficient of friction test, and all environmental tests, can be completed using a single representative box/cover (instead of samples from all box/cover sizes) as long as the test report indicates the following:

1. Materials of construction, compositions, and manufacturing processes are identical for all box and cover sizes submitted for listing on the APL.
2. Size (width x length x depth) of the representative box/cover.

635-2.3 Junction Boxes:

635-2.3.1 Fabrication: Provide galvanized steel, aluminum or NEMA 4X non-metallic junction boxes. Ensure all attachment hardware is Type 316 or 304, passivated stainless steel.

Ensure the outside surface has a smooth, uniform finish. Ensure boxes are free of burrs, pits, sharp corners and dents. Ensure all welds are neatly formed and free of cracks, blow holes, and other irregularities.

635-2.3.1.1 Aerial Junction Boxes: Unless otherwise shown in the Plans, provide aerial junction boxes with minimum inside dimensions of 8 inches wide by 8 inches long and at least 3 inches deep.

635-2.3.1.2 Mounted Junction Boxes: Provide mounted junction boxes fabricated of 5052 sheet aluminum alloy with a minimum thickness of 1/8 inch. Ensure all mounted junction boxes have a hinged door and lock as specified in Section 676.

Unless otherwise shown in the Plans, provide mounted junction boxes for the following installations:

For pole and cabinet mounted installations, provide junction boxes with minimum inside dimensions of 13 inches long by 10 inches wide and at least 3 inches deep.

For base mounted installations, provide junction boxes with minimum inside dimensions of 21 inches long by 10 inches wide and at least 8 inches deep.

635-2.3.1.3 Embedded Junction Boxes: Provide weatherproof embedded junction boxes for use in concrete substructures or superstructures. Include gasketed weatherproof covers made of the same material as the box and Type 316 or 304, stainless steel, tamper resistant screws for securing the cover. Fabricate galvanized steel boxes and their covers from steel meeting the requirements of ASTM A36 and galvanized in accordance with ASTM A123.

For embedded junction boxes not exposed to vehicular impacts, provide the following types of junction boxes. Where the structure's environmental classification is slightly or moderately aggressive, provide a galvanized steel or NEMA 4X (non-metallic) box, as approved by the Engineer. Where the structure's environmental classification is extremely aggressive, provide a NEMA 4X (non-metallic) box, unless otherwise directed by the Engineer.

For embedded junction boxes exposed to vehicular impacts, provide a galvanized steel box regardless of the structure's environmental classification.

635-2.3.2 Barrier Terminal Blocks: Provide a barrier terminal block with a minimum of ten positions and rated at 600 V_{AC} in all aerial and mounted junction boxes. Ensure each terminal block position has two screws electrically connected by a shorting bar or other Department approved method. Ensure all terminal block positions are numbered sequentially.

635-3 Installation.

635-3.1 General: Do not install power and communication cables in the same box unless otherwise shown in the Plans.

When signal or 120 volt (or greater) power is present, ground all metal covers in accordance with Section 620.

635-3.2 Pull and Splice Boxes: Install pull and splice boxes in accordance with the Design Standards, Index No. 17700. Ensure pull and splice boxes are sized for the amount of cable to be placed inside. Ensure that the pull or splice box cover is flush with the concrete apron or sidewalk. Do not install pull or splice boxes in roadways, driveways, parking areas, ditches or public sidewalk curb ramps. Avoid placing pull and splice boxes in low-lying locations with poor drainage. Ensure that pull and splice boxes house fiber optic cable without subjecting the cable to a bend radius less than 14 times the diameter of the cable.

635-3.2.1 Placement and Spacing: Place pull and splice boxes as shown in the Plans and at the following locations, unless directed otherwise by the Engineer:

1. At all major fiber optic cable and conduit junctions.
2. Approximately every 2,500 feet for fiber optic cable applications in rural areas with any continuous section of straight conduit if no fiber optic cable splice is required.
3. At a maximum of 1,760 feet for fiber optic cable applications in metropolitan areas.
4. At each end of a tunnel, and on each side of a river or lake crossing.
5. On each side of an aboveground conduit installation, such as an attachment to a bridge or wall.
6. At all turns in the conduit system.
7. Near the base of a service pole or communication cabinet to provide:
   a. A transition point between the fiber optic conduits extending from the fiber backbone and the conduit feeding the communication cabinet.
   b. An assist point for the installation of fiber optic drop cable.
   c. Storage of slack fiber optic drop cable.

635-3.2.2 Electronic Box Marker: Equip all pull and splice boxes buried below finish grade with an electronic box marker inside the pull or splice box to mark the location. Ensure that the electronic box marker is a device specifically manufactured to electronically mark and locate underground facilities. Ensure that the electronic box marker includes circuitry and an antenna encased in a waterproof polyethylene shell. Ensure that the outer shell is impervious to minerals, chemicals, and temperature extremes normally found in underground plant environments. Ensure that the electronic box marker does not require any batteries or active components to operate. Ensure that electronic box markers used to mark fiber optic cable and general telecom applications are orange in color and operate at 101.4 kHz. Ensure that the electronic box marker's passive circuits produce an RF field when excited by a marker locator to direct the locator to the marker's position. Ensure that the electronic box marker has a minimum operating range of 5 feet from the marker locator.

635-3.3 Aerial Junction Boxes: Install aerial junction boxes in accordance with the Design Standards, Index No. 17733.

635-3.4 Mounted Junction Boxes: Install mounted junction boxes in accordance with the Design Standards, Index No. 17841. Ensure that the bottom surface of pole mounted junction boxes is a minimum of 4 feet above the finished grade.

635-3.5 Cable Terminations: Make cable terminations in junction boxes in accordance with Section 632. Route and form the cable to allow access to the terminal screws. Do not cover the terminal identification numbers with the cable.

635-4 Relocation of Pull, Splice, and Junction Boxes.

Relocation of pull, splice, and junction boxes shall consist of removing an existing box and installing the box at the location shown in the Plans. Restore the area of the box removal and relocation to the condition of the adjacent area. The costs for restoration will be included in the Contract unit price of the relocation.

Boxes damaged due to the Contractor's operations must be replaced by the Contractor at no cost to the Department. Replacement boxes must be of the same material and size of the existing box, unless directed otherwise by the Engineer.

635-5 Warranty.

Ensure all pull, splice, and junction boxes have a manufacturer's warranty covering defects for a minimum of one year from the date of final acceptance in accordance with 5-11 and Section 608. Ensure the warranty includes providing replacements, within 30 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.

635-6 Method of Measurement.

The Contract unit price each for pull, splice, and junction box, furnished and installed, will consist of the pull, splice, and junction box including all required hardware for the type of box and location as specified in the Contract Documents, and all labor and materials necessary for a complete and accepted installation.

635-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, except grounding.

No separate payment for embedded junction boxes will be made. The Contractor shall include the cost of embedded junction boxes in the Contract unit price for the concrete substructure or superstructure items.

No separate payment will be made for the removal of pull, splice, and junction boxes.

Payment will be made under:

Item No. 635- 2- Pull, and Splice Boxes - each.
Item No. 635- 3- Junction Boxes - each.

SECTION 639
ELECTRICAL POWER SERVICE ASSEMBLIES

639-1 Description.

Power service assemblies are utilized for signals, lighting, ITS, and other roadway applications. Install electrical power service assemblies for either overhead service or underground service in accordance with the details shown in the Design Standards, Index No. 17504 or 17736.

Coordinate with the power company to provide electrical service to the locations shown in the Plans. Consult and cooperate with the power company when power is needed at the service point. Furnish and install only those parts of the metering equipment or connections that are required by the power company in the locality involved.

639-2 Definitions.

1. Overhead Service: A service assembly which is supplied electrical power from an overhead power company source. Include with an overhead electrical power service assembly the following components:

a. Weatherhead
b. Conduit
c. Electrical Service wire
d. Meter base (when required)
e. Service disconnect
f. Surge Protective Device

2. Underground Service: A service assembly which is supplied electrical power from an underground power company source. Include with an underground electrical power service assembly the following components:

a. Conduit
b. Electrical Service wire
c. Meter base (when required)
d. Service disconnect
e. Surge Protective Device

639-3 Materials.

639-3.1 Weatherhead: Use a weatherhead made of a copper free aluminum alloy with three electrical service wire entrance holes, meeting National Electric Code (NEC) requirements.

639-3.2 Conduit: Use conduit meeting the requirements of Section 630. Meet the requirements of Section 562 for coating all field cut and threaded galvanized pipe.

639-3.3 Electrical Service Wire: Use No. 6 AWG stranded copper wire with XHHW (cross-linked polyethylene (XLPE) high heat-resistant, water-resistant) insulation, rated at 600 V in dry and wet condition for connections between service disconnect and traffic cabinet, unless otherwise shown in the Plans.

639-3.4 Meter Base: Use meter bases approved by the local electric power company.

639-3.5 Service Disconnect:

639-3.5.1 Enclosure (Cabinet): Use an enclosure conforming to National Electrical Manufacturers Association (NEMA) Standards for Type 3R, Type 3S or Type 4, made of galvanized steel, aluminum, stainless steel or other materials approved by the Engineer.

Ensure that the enclosure has a hinged door which can be locked with a padlock. Provide padlock and two keys. Do not use external handles or switches. Ensure that the inside dimensions meet NEC requirements.

639-3.5.2 Circuit Breaker: Use a manually resettable circuit breaker which has a current rating above the current rating of the circuit breaker to which electrical power is provided. Do not use less than a 40A circuit breaker.

639-3.6 Surge Protective Device: Use a lightning arrester rated for a maximum permissible line to ground voltage of 175 VAC.

639-3.7 Attachment Hardware: Use attachment hardware that meets the requirements of Section 603.

639-4 Installation Requirements.

639-4.1 General: Meet the following requirements for the installation of individual components of the electrical power service assembly:

Use extreme care and caution in the installation of all components of the electrical power service assembly.

Follow installation procedures recommended by NEC and National Electrical Safety Code (NESC).

Consider the location of electrical power service assemblies as shown in the Plans to be approximate, and coordinate with the appropriate electrical power company authority to determine the exact locations of each assembly.

639-4.2 Weatherhead: Securely attach the weatherhead to the upper end of the conduit which extends upward from the meter base (or service disconnect if a meter base is not required) to a minimum height of 22 feet above grade.

639-4.3 Conduit: Securely attach all conduit to the pole or cabinet with a maximum distance of 5 feet between conduit attachment hardware.

639-4.4 Electrical Service Wire: Install the electrical service wire in a manner which will ensure that damage to the installation will not occur.

Ensure that the service wire is of sufficient length after installation in the conduit to provide for attachment to the power company service and for termination within the cabinet for which power is required.

639-4.5 Meter Base: When a meter base is required, securely fasten the meter base to the pole or cabinet. Install pole mounted meter bases at a minimum height of 5-1/2 feet above grade when measured from the center of the meter base or meet the local electric power company requirement, whichever is greater.

639-4.6 Service Disconnect: Securely fasten the service disconnect to the pole (or cabinet with the Engineers approval), and electrically position the service disconnect between the service meter and the traffic control device cabinet to which electrical service is being supplied. Install pole mounted service disconnects a minimum of 4 feet above grade when measured from the bottom of the disconnect. For cabinet installations, mount the service disconnect at a height approved by the Engineer or as shown in the Plans.

639-5 Method of Measurement.

639-5.1 General: Measurement for payment will be in accordance with the following work tasks.

Payment for electrical service wire between service disconnect and traffic cabinet is based upon the distance of the cable run and includes payment for all conductors used in the

run. For lighting applications, payment for service conductors will be made in accordance with Section 715.

Payment for conduit and electrical service wire which is vertically attached to the electrical power assembly is considered incidental and paid under item 639-1.

639-5.2 Furnish and Install: The Contract unit price per foot of electrical service wire, or the Contract unit price each for electrical service disconnect, furnished and installed, will include furnishing all materials and hardware as specified in the Contract Documents, and all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation.

639-5.3 Furnish: The Contract unit price per foot of electrical service wire, or the Contract unit price each, for electrical service disconnect, furnished, will include the cost of the required materials and hardware as specified in the Contract Documents, plus all shipping and handling costs involved in delivery as specified in the Contract Documents.

639-5.4 Install: The Contract unit price per foot of electrical service wire, or the Contract unit price each, for electrical service disconnect, installed, will include all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation. The Engineer will supply electrical service wire or electrical service disconnect.

639-5.5 Electrical Power Service: The Contract unit price per assembly for electrical power service will include furnishing and installing all material and hardware as specified in the Contract Documents, and all labor and equipment necessary to make a complete and accepted installation.

639-6 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 639- 1-	Electrical Power Service - per assembly.
Item No. 639- 2-	Electrical Service Wire - per foot.
Item No. 639- 3-	Electrical Service Disconnect - each.

SECTION 646
ALUMINUM POLES, PEDESTALS, AND POSTS

646-1 Description.

Furnish and install aluminum poles, pedestals, and posts at the locations shown in the Plans and in accordance with the details shown in the Plans and Design Standards. An aluminum pedestal consists of a pole and a transformer base.

646-2 Materials.

646-2.1 Poles and Posts: Use nominal 4 inch diameter Schedule 40 aluminum poles and posts meeting the requirements of The Aluminum Association Alloy 6061-T6 and ASTM B241. Poles used with transformer bases must be threaded with No. 8 NPT threads. Sufficient threads are required to fully seat the pole into the hub of the pedestal base.

646-2.2 Transformer Base: Use transformer bases listed on the Department's Approved Product List (APL).

Manufacturers seeking APL approval of proprietary transformer bases must submit an application in accordance with Section 6, independent laboratory test report, and calculations and drawings showing details, notes, materials, dimensions, and sizes that the transformer base meets the following requirements:

1. Materials: Meets the material requirements of Aluminum Association Alloy 319 or 356-T6 and ASTM B26 or ASTM B108.
2. Height: Base is 12 to 18 inches in height with a threaded hub at the top for mounting a nominal 4 inch Schedule 40 aluminum pole. The threaded hub must be tapped to allow full pole engagement.
3. Fastening: Provides for fastening to a foundation with four 3/4 inch anchor bolts located 90 degrees apart and a bolt circle diameter of 14 inches. The base design must allow for bolts that are placed off-center.
4. Door: Provides a door opening of not less than 8 inches by 8 inches. The door must be constructed of fiberglass or other non-combustible, non-aluminum material. Attach the door to the base with cleats and one stainless steel socket button head screw or by other means suitable for NEMA 3 electrical enclosures.
5. Moment Capacity: Supports an ultimate moment capacity of 10,000 foot-pounds. Submit certified test reports from the manufacturer verifying that each base model meets the moment capacity without breaking, cracking or rupturing in any manner.
6. Breakaway: Meets the requirements in the latest revision of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Submit the FHWA certification for product approval.
7. Identification: Is legibly and visibly marked with the manufacturer's name or logo and the model number.

646-2.3 Anchor Bolts: Provide ASTM F1554 Grade 55 right angle bend anchor bolts, 3/4 inch diameter, 18 inches long, 3 inch leg and with a 5 inch UNC thread length. For each bolt, provide two 3/4 inch ASTM A563 Grade A heavy hex nuts and one 3/16 inch thick by 3 inch round ASTM A36 plate washer or one ASTM F436 Type 1 washer. Anchor bolts, washers and hex nuts must be galvanized in accordance with ASTM F2329.

646-2.4 End Caps: Provide end caps sized for nominal 4 inch diameter Schedule 40 aluminum poles. The cap must be a minimum of 1/4 inch thick and tapped for at least two set screws. Set screws will be provided with the end cap.

646-2.5 Shims: Provide U-shaped galvanized steel shims 2 inches wide by 2-1/2 inches long, shaped to fit around a 3/4 inch anchor bolt.

646-2.6 Concrete: Use Class 1 concrete meeting the requirements of Section 346.

646-3 Installation.

646-3.1 General: Verify the length of the column supports in the field prior to fabrication to permit the appropriate sign or signal height.

646-3.2 Foundations: Construct foundations in accordance with the applicable Design Standards.

The Contractor may use precast foundations in augered or excavated holes that are a minimum of 12 inches larger than each axis dimension of the precast foundation. The holes must be clean and without loose material. Obtain precast foundations from a manufacturing plant that is currently on the Department'sProduction Facility Listing. Producers seeking inclusion on the list shall meet the requirements of Section 105. Fill the voids around precast foundations with flowable fill meeting the requirements of Section 121 or clean sand placed using hydraulic methods to a level of 6 inches below grade.

646-3.3 Setting Anchor Bolts: Set anchor bolts 90 degrees apart with a bolt circle diameter of 14 inches. Adjust anchor bolts to a plumb line and hold rigidly in position to prevent displacement while pouring concrete.

646-3.4 Installation: Do not erect poles until the concrete strength is at least 2500 psi. Plumb the poles after erection using shims if necessary to obtain precise alignment.

646-3.5 Grounding: Meet the requirements of Section 620 and the applicable Design Standards.

646-4 Method of Measurement.

The Contract unit price per each for aluminum pedestals and posts, furnished and installed, will include all materials and equipment as specified in the Contract Documents, and all labor and materials necessary for a complete and accepted installation.

Payment for removal of aluminum poles will include the complete removal of the pole and foundation, pedestrian detector and pedestrian signal. Separate payment for the removal of the pedestrian detector and pedestrian signal will be made only when the pole/pedestal is to remain.

Payment for grounding will be incidental to the pedestal or post.

646-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 646- Aluminum Poles - per each.

SECTION 653
PEDESTRIAN SIGNAL ASSEMBLIES

653-1 Description.

Furnish and install pedestrian signal assemblies as shown in the Plans and Design Standards, Index No. 17764. Meet the requirements of Section 603.

653-2 Materials.

653-2.1 General: Use pedestrian signals listed on the Department's Approved Product List (APL). Pedestrian signal assemblies must meet the requirements of the latest edition of the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) and the Institute of Transportation Engineers (ITE) standard for Pedestrian Traffic Control Signal Indications.

653-2.2 Housing and Visor: The housing must be weatherproof, sectional and may consist of as many sections as optical units. The housing must prevent light from escaping from one unit to another. The top and bottom opening of the housing must include a circular 72-tooth serrated connection (2 inch nominal I.D.) capable of providing positive positioning and alignment in 5 degree increments. When assembled and tightened, these connections must prevent rotation or misalignment. The serrated area must start at the outside of the 2 inch hole and be at least 1/8 inch wide. The teeth must have a minimum depth of 3/64 inch between peaks and valleys, free from burrs or other imperfections, and provide positive locking with the grooves of mating sections, framework, and brackets. The serration on the top circular connection of a signal section must have a valley at the 0 degree position and the serration on the bottom circular connection must have a peak at the 0 degree position, both aligned perpendicular to the front of the section. Housings must include latch pads and manual stainless steel latching devices that are captive, or non-removable. Housings must have at least two latching points.

Reinforce all mounting points and adjacent housing material. The door enclosing the lens must be hinged and held securely to the housing. Provide a gasket meeting the requirements of ASTM D1056, Grade 2B2 between the housing and door and between the lens and door. If the fitting between the housing and door is weather-tight, the gasket may be omitted.

Provide a visor for each signal face. Light must not escape between the door and visor. The visor must be three-sided and extend a minimum of 7 inches at the top from the face of the lens. The visor must be constructed of noncorrosive sheet metal, not less than 0.05 inch thick, (No. 18 gauge in thickness) or polycarbonate.

All metal housings and visors must be powder-coat painted black in accordance with Military Standard MIL-PRF-24712A or AAMA-2603-02 with a reflectance value not exceeding 25 percent as measured by ASTM E97. For polycarbonate heads, the black color must be incorporated into the material before the molding process.

The housing must be constructed of a non-corrosive material. Cast metal parts must have a minimum tensile strength of 1 ksi (117 MPa) and sheet metal parts a minimum tensile strength of 27 ksi (186 MPa).

653-2.2.1 Die castings: Meet the requirements in ASTM B85 for the physical characteristics and chemical content for alloys S12A, S12B, SC84A, SC84B, SG100A and SG100B.

653-2.2.2 Sand Castings: Meet the requirements in ASTM B26 for the physical characteristics and chemical content for alloys S5A and CS72A.

653-2.2.3 Permanent mold castings: Meet the requirements in ASTM B108 for the physical characteristics and chemical content for alloys S5A and CS72A.

653-2.2.4 Polycarbonate: Polycarbonate housing assemblies, doors and visors must be molded from ultraviolet stabilized polycarbonate plastic with a minimum thickness of 0.1 inches, plus or minus 0.01 inch, and provide the following physical properties:

Table 1		
Test	Minimum Requirement	Method
Specific Gravity	1.17	ASTM D 792
Vicat Softening Temp.	305-325°F (152 – 163°C)	ASTM D 1525
Brittleness Temp.	Below -200°F (-129°C)	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength	Yield, 8500 psi (58 MPa)	ASTM D 638
Elongation at yield	5.5 - 8.5%	ASTM D 638
Shear Strength	Yield, 5500 psi (38 MPa)	ASTM D 732
Izod impact strength	15ft-lb/in (800 J/m)	ASTM D 256
Fatigue strength	950 psi (6.5MPa) at 2.5 mm cycles	ASTM D 671

653-2.3 Light Emitting Diode (LED) Pedestrian Signal Optical Unit (State Standard): Provide a countdown pedestrian signal module meeting the requirements of the latest ITE LED Pedestrian Signal Specifications.

653-2.4 Electrical: Wiring must be color-coded No. 18 AWG or larger, stranded wires with an approved 600 V outdoor insulation rating or equivalent. Wires must be a minimum of 3 feet long with self-insulating slide-on terminals with no bare wiring exposed where wires are secured.

The pedestrian signal must include a terminal block containing a minimum of five circuits, each with two noncorrosive screw-type terminals. Each terminal must accommodate three No. 18 AWG conductors and be labeled for ease of identification. The terminal block must not be obstructed and be visible when the housing is open.

653-2.5 Hardware: All brackets used to mount pedestrian signals must be an aluminum alloy cast fitting, pipe or equivalent material approved by the Department. Aluminum and aluminum alloy bars, rods, wires, profiles, and tubes must meet ASTM B221. Aluminum-alloy sand casting must meet ASTM B26. All mounting hardware must be painted black with a reflectance value not exceeding 25 percent as measured by ASTM E97.

Ensure that all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Stainless Steel bolts, screws and studs must meet ASTM F593. Nuts must meet ASTM F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Bolts, studs, and threaded rod must meet ASTM A307. Structural bolts must meet ASTM A325.

653-3 Installation.

653-3.1 General: Use pedestrian signal assemblies capable of being maintained, adjusted, and disassembled with ordinary hand tools. Pre-assemble the pedestrian signal, with the exception of mounting hardware, prior to installation at the site. Construct the pedestrian

signal assembly (including the mounting hardware) to be a weather-tight unit. Conceal all conductors.

653-3.2 Placement: Position pedestrian signals and all mounting assembly members as either plumb or level, and symmetrically arranged. Align signals in the line of the pedestrian's vision for the crosswalk being used.

653-3.3 Installation Sequence: Install all pedestrian signal assemblies at any intersection as a single operation unless a staged operation is approved by the Engineer. Do not install signals at any intersection until all other signal equipment, including the controller, and pedestrian detectors are in place and ready for operation, unless completely covered in accordance with 650-3.10.

653-4 Method of Measurement.

The Contract unit price per assembly for pedestrian signal assembly, furnished and installed, (including mounting hardware but not including poles or pedestals) will include all materials and equipment as specified in the Contract Documents, and all labor and materials necessary for a complete and accepted installation.

Payment for removal of pedestrian signal assemblies will be made only when the pole/pedestal is to remain. Otherwise, the removal of pedestrian signal assemblies are included in the removal of the pole or pedestal.

653-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 653- Pedestrian Signal - per assembly.

SECTION 660
VEHICLE DETECTION SYSTEM

660-1 Description

Furnish and install a vehicle detection system in accordance with the Contract Documents. Use vehicle detection systems and loop sealant that meet the requirements of this Specification and are listed on the Department's Approved Product List (APL).

660-2 Materials

660-2.1 Classification of Types: Vehicle detection and data collection systems are classified by the type of function they perform and the type of technology that they employ.

660-2.1.1 Functional Types: Provide the functional type detailed in the Plans.

660-2.1.1.1 Vehicle Presence Detection Systems: Vehicle presence detection systems produce a corresponding output any time that a vehicle occupies the physical or virtual area of the detector.

660-2.1.1.2 Traffic Data Detection Systems: Traffic data detection systems provide presence, volume, occupancy, and speed data for the lanes they are configured to monitor.

660-2.1.1.3 Probe Data Detection Systems: Probe data detection systems provide speed data and travel times for a road segment. Probe data detectors use automatic vehicle identification (AVI) technologies to establish a unique identifier for each vehicle they detect. This identifier is then transmitted to a central site where it can be matched to past or future detections of the same vehicle at different detector locations.

660-2.1.2 Technology Types: Provide the detection technology type detailed in the Plans. Detection technology types include inductive loop, video, microwave, wireless magnetometer, and AVI systems.

660-2.1.2.1 Inductive Loop: An inductive loop detection system uses a minimum of one inductive loop and loop detector. The system operates by energizing and monitoring wire embedded in the road surface to detect vehicle presence and provide an output to traffic controllers or other devices that can generate volume, occupancy, and speed data (detection output).

660-2.1.2.1.1 Inductive Loop Detector Units: Ensure rack mount inductive loop detector units meet the requirements of NEMA TS-2-2003. Ensure shelf mount detector units meet the requirements of NEMA TS-1-1989.

660-2.1.2.1.2 Loop Wire: Use No. 12 AWG stranded copper wire with Type XHHW cross-linked polyethylene insulation, or No. 14 AWG stranded copper wire with Type XHHW cross-linked polyethylene insulation and an additional outer sleeve composed of polyvinylchloride or polyethylene insulation that meets the requirements of International Municipal Signal Association (IMSA) 51-7.

660-2.1.2.1.3 Shielded Lead-in Cable: Use No. 14 AWG two conductor, stranded copper wire with shield and polyethylene insulation, meeting the requirements for IMSA 50-2.

660-2.1.2.1.4 Splicing Material: Butt-end connectors may be used for splicing the loop wire to the lead-in cable. Butt-end connectors must be non-insulated. Use resin-core solder for soldered splices. Splicing tape must be self-fusing silicone rubber. Ensure

insulated tubing used to cover splice is heat-shrinkable, cross-linked polyethylene with a silicon sealant inside the tubing and an insulation rating of at least 600 V.

660-2.1.2.1.5 Loop Sealant: Ensure loop sealant is intended for traffic loop embedding in both asphalt and concrete pavement. Ensure sealant is furnished in a one part or pre-measured two part formulation meeting the requirements specified herein.

Ensure that loop sealant is self-leveling when applied and is designed to be installed flush with the roadway surface. Ensure that loop sealant does not run out of unlevel slots as tested for viscosity using ASTM D562 at 77°F. Ensure loop sealant is tack free within a maximum of 2 hours from time of application and when cured as tested for tack free time using ASTM C679 at 77°F.

Ensure loop sealant securely adheres to concrete and asphalt when installed in a 3/8 inch by 3 inch saw cut, cured for 2 weeks at 77°F as tested for adhesion using visual inspection. Ensure loop sealant shows no visible signs of shrinkage after curing when installed in a 3/8 inch by 3 inch saw cut, cured for 2 weeks at 77°F as tested for shrinkage using a dimensional measurement.

Ensure loop sealant resists weather, oils, gasoline, antifreeze, and brake fluid as tested for absorption using ASTM D570 for water, No. 3 oil, gasoline, antifreeze, and brake fluid for 24 hours. Ensure loop sealant resists penetration of foreign materials as tested for durometer hardness using ASTM D2240 Shore A for 24 hours.

Ensure loop sealant resists cracking caused by expansion and contraction due to temperature changes as tested for tensile strength and elongation using ASTM D412.

Ensure loop sealant does not become brittle with age or temperature extremes as tested for weight loss, cracking, and chalking using ASTM C1246.

Ensure loop sealant has a minimum shelf life of 12 months when stored per manufacturer recommendations.

Loop sealant containers must have a label showing the manufacturer's name or trademark, model number, date of manufacture or manufacturer's batch number and installation instructions.

660-2.1.2.2 Video: A video vehicle detection system (VVDS) uses one or more cameras and video analytics hardware and software to detect vehicle presence, provides a detection output, and generates volume, occupancy, and speed data.

660-2.1.2.2.1 Configuration and Management: Ensure that the VVDS is provided with software that allows local and remote configuration and monitoring. Ensure that the system can display detection zones and detection activations overlaid on live video inputs.

Ensure that the VVDS allows a user to edit previously defined configuration parameters, including size, placement, and sensitivity of detection zones.

Ensure that the VVDS retains its programming in nonvolatile memory. Ensure that the detection system configuration data can be saved to a computer and restored from a saved file. Ensure that all communication addresses are user programmable.

Ensure that the detection system software offers an open Application Programming Interface (API) and software development kit available to the Department at no cost for integration with third party software and systems.

660-2.1.2.2.2 Detection Camera: Provide a camera that is furnished or approved by the video detection system manufacturer and listed with the detection system on the APL.

660-2.1.2.2.3 Machine Vision Processor: Ensure the VVDS includes a machine vision processor that allows video analysis, presence detection, data collection, and interfaces for inputs and outputs as well as storage and reporting of collected vehicle detection data.

660-2.1.2.2.4 Communications: Ensure that the VVDS includes a minimum of one serial or Ethernet communications interface.

Ensure the serial interface and connector conforms to Telecommunications Industry Association (TIA)-232 standards. Ensure that the serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100 Base TX connection. Verify that all unshielded twisted pair/shielded twisted pair network cables and connectors comply with TIA-568.

Ensure wireless communications are secure and that wireless devices are Federal Communications Commission (FCC) certified. Ensure that the FCC identification number is displayed on an external label and that all detection system devices operate within their FCC frequency allocation.

Ensure cellular communications devices are compatible with the cellular carrier used by the agency responsible for system operation and maintenance.

Ensure the system can be configured and monitored via one or more communications interface.

660-2.1.2.2.5 Video Inputs and Outputs: Ensure that analog video inputs and outputs utilize BNC connectors.

660-2.1.2.2.6 Solid State Detection Outputs: Ensure outputs meet the requirements of NEMA TS2-2003, 6.5.2.26.

660-2.1.2.2.7 Electrical Requirements: Ensure the system operates using a nominal input voltage of 120 volts of alternating current (V_{AC}). Ensure that the system will operate with an input voltage ranging from 89 to 135 V_{AC}. If a system device requires operating voltages other than 120 V_{AC}, supply a voltage converter.

660-2.1.2.3 Microwave: A microwave vehicle detection system (MVDS) transmits, receives, and analyzes a FCC-certified, low-power microwave radar signal to detect vehicle presence, provide a detection output, and generate volume, occupancy, and speed data.

Ensure that sidefire MVDS sensors used for data collection have a minimum 200-foot range and the capability to detect 8 lanes of traffic.

660-2.1.2.3.1 Configuration and Management: Ensure that the MVDS is provided with software that allows local and remote configuration and monitoring. Ensure that the system software can display detection zones and detection activations in a graphical format.

Ensure that the MVDS allows a user to edit previously defined configuration parameters, including size, placement, and sensitivity of detection zones.

Ensure that the MVDS retains its programming in nonvolatile memory. Ensure that the detection system configuration data can be saved to a

computer and restored from a saved file. Ensure that all communication addresses are user programmable.

Ensure that the detection system software offers an open API and software development kit available to the Department at no cost for integration with third party software and systems.

660-2.1.2.3.2 Communications: Ensure that major components of the detection system (such as the sensor and any separate hardware used for contact closures), include a minimum of one serial or Ethernet communications interface.

Ensure the serial interface and connector conforms to TIA-232 standards. Ensure that the serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100 Base TX connection. Verify that all unshielded twisted pair/shielded twisted pair network cables and connectors comply with TIA-568.

Ensure wireless communications are secure and that wireless devices are FCC-certified. Ensure that the FCC identification number is displayed on an external label and that all detection system devices operate within their FCC frequency allocation.

Ensure cellular communications devices are compatible with the cellular carrier used by the agency responsible for system operation and maintenance.

Ensure the system can be configured and monitored via one or more communications interface.

660-2.1.2.3.3 Solid State Detection Outputs: Ensure outputs meet the requirements of NEMA TS2-2003, 6.5.2.26.

660-2.1.2.3.4 Electrical Requirements: Ensure the microwave detector will operate with a nominal input voltage of 12 V_{DC}. Ensure the microwave detector will operate with an input voltage ranging from 89 to 135 V_{AC}. If any system device requires operating voltages other than 120 V_{AC}, supply a voltage converter.

Ensure that the detector is FCC-certified and that the FCC identification number is displayed on an external label. Ensure that the detector has been granted authorization to operate within a frequency range established and approved by the FCC.

660-2.1.2.4 Wireless Magnetometer: A wireless magnetometer detection system (WMDS) uses one or more battery-powered wireless sensors embedded in the road surface, which communicates data by radio to a roadside receiver. Wireless magnetometer systems detect vehicle presence and provide a detection output to traffic controllers or other devices that can generate volume, occupancy, and speed data.

660-2.1.2.4.1Configuration and Management: Ensure that the detection system is provided with software that allows local and remote configuration and monitoring.

Ensure that the WMDS allows a user to edit previously defined configuration parameters.

Ensure that the WMDS retains its programming in nonvolatile memory. Ensure that the detection system configuration data can be saved to a computer and restored from a saved file. Ensure that all communication addresses are user programmable.

Ensure that the detection system software offers an open API and software development kit available to the Department at no cost for integration with third party software and systems.

660-2.1.2.4.2 Communications: Ensure that components of the detection system (such as sensors, access points, and contact closure cards) include a minimum of one serial or Ethernet communications interface.

Ensure the serial interface and connector conforms to TIA-232 standards. Ensure that the serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100 Base TX connection. Verify that all unshielded twisted pair/shielded twisted pair network cables and connectors comply with TIA-568.

Ensure wireless communications are secure and that wireless devices are FCC-certified. Ensure that the FCC identification number is displayed on an external label and that all detection system devices operate within their FCC frequency allocation.

Ensure cellular communications devices are compatible with the cellular carrier used by the agency responsible for system operation and maintenance.

Ensure the system can be configured and monitored via one or more communications interface.

660-2.1.2.4.3 Solid State Detection Outputs: Ensure outputs meet the requirements of NEMA TS2-2003, 6.5.2.26.

660-2.1.2.4.4 Electrical Requirements: Ensure the detection system will operate with an input voltage ranging from 89 to 135 V_{AC}. If any system device requires operating voltages other than 120 V_{AC}, supply a voltage converter.

660-2.1.2.5 Automatic Vehicle Identification (AVI): An AVI detection system uses one or more different methods to collect information that can be used to establish a unique identifier for each vehicle detected and the time and location that the vehicle was detected. AVI detection systems collect data using radio-frequency identification (RFID), optical character recognition, magnetic signature analysis, laser profiling, Bluetooth®, or other methods to establish vehicle identifier, time, and location.

660-2.1.2.5.1 Configuration and Management: Ensure that the detection system is provided with software that allows local and remote configuration and monitoring.

660-2.1.2.5.2 Communications: Ensure that components of the detection system (such as sensors, controllers, and processing hardware) include a minimum of one serial or Ethernet communications interface.

Ensure the serial interface and connector conforms to TIA-232 standards. Ensure that the serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2).

Ensure that wired Ethernet interfaces provide a 10/100 Base TX connection. Verify that all unshielded twisted pair/shielded twisted pair network cables and connectors comply with TIA-568.

Ensure wireless communications are secure and that wireless devices are FCC-certified. Ensure that the FCC identification number is displayed on an

external label and that all detection system devices operate within their FCC frequency allocation.

Ensure cellular communications devices are compatible with the cellular carrier used by the agency responsible for system operation and maintenance.

Ensure the system can be configured and monitored via one or more communications interface.

660-2.1.2.5.3 Probe Data Detector Requirements

1. Transponder Readers: Ensure transponder readers are compatible with multiple tag protocols, including Allegro and the protocol defined in ISO18000-6B.

2. Bluetooth Readers: Ensure that Bluetooth readers will operate using solar power and cellular communications. Ensure that Bluetooth readers will operate with a nominal input voltage of 12 V_{DC}.

3. License Plate Readers: Ensure license plate readers do not require the use of visible strobes or other visible supplemental lighting.

660-2.1.2.5.4 Electrical Requirements: Ensure the detection system will operate with an input voltage ranging from 89 to 135 V_{AC}. If any system device requires operating voltages other than 120 V_{AC}, supply a voltage converter.

660-2.1.3 Mechanical Requirements for all Detectors: Ensure equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number. Ensure that all parts are made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. Ensure that all fasteners exposed to the elements are Type 304 or 316 passivated stainless steel.

660-2.1.4 Environmental Requirements for all Detectors: Meet the environmental requirements of NEMA TS-2-2003.

660-2.2 Vehicle Presence Detection System Performance Requirements: Ensure presence detectors provide a minimum detection accuracy of 98%. Ensure presence detectors meet the requirements for modes of operation in NEMA TS2-2003, 6.5.2.17.

660-2.2.1 Vehicle Presence Detection Accuracy: To verify conformance with the accuracy requirements in this Section and as a precondition for listing on the APL, sample data collected from the vehicle detection system will be compared against ground truth data collected during the same time by human observation or by another method approved by the FDOT Traffic Engineering Research Laboratory (TERL). Ensure sample data is collected over several time periods under a variety of traffic conditions. Weight each data sample to represent the predominant conditions over the course of a 24-hour period. Samples will consist of 15- and 30-minute data sets collected at various times of the day. Representative data periods and their assigned weights are provided in Table 660-1.

Table 660-1
Data Collection Periods

Period	Intended To Represent	Duration	Weight
Early morning (predawn) [EM]	12:30 a.m. – 6:30 a.m.	15 minutes	24
Dawn [DA]	6:30 a.m. – 7:00 a.m.	30 minutes	2
AM Peak [AMP]	7:00 a.m. – 8:00 a.m.	15 minutes	4
Late AM Off-Peak [LAOP]	8:00 a.m. – 12:00 p.m.	15 minutes	16

Noon [NO]	12:00 p.m. – 1:00 p.m.	15 minutes	4
Afternoon Off-Peak [AOP]	1:00 p.m. – 5:00 p.m.	15 minutes	16
PM Peak [PMP]	5:00 p.m. – 6:00 p.m.	15 minutes	4
Dusk [DU]	6:00 p.m. - 6:30 p.m.	30 minutes	2
Night [NI]	6:30 p.m. - 12:30 a.m	15 minutes	24
Total Sum of Weights			96

For instance, the sample gathered for the Late AM Off-Peak period is intended to represent typical traffic conditions between 8:00 a.m. and 12:00 p.m. Since the sample period's duration is 15 minutes and the actual period of time represented is 4 hours, the multiplication factor or weight assigned is 16, the number of 15-minute intervals in a 4 hour period.

660-2.2.1.1 Calculation of Vehicle Presence Detection Accuracy: Compute presence detection accuracy as described in this subsection.

Determine individual lane presence detection accuracy per period by subtracting from 100 percent the absolute difference of the total time monitored and the cumulative error time, divided by total time, expressed as a percentage.

In the equation in 660-2.2.1.1.1, "EM" represents the early morning period. The variable "i" represents a detector or detection zone and could vary from 1,…, N, where "N" is the total number of detectors observed. Substitute other detector numbers and periods as necessary to determine accuracy for all detectors during each period (i.e., dawn, AM peak, late AM off peak, etc.).

Variables used in the following equations are identified as follows:

PA = Presence detection accuracy
TT = Total time
CET = Cumulative Error Time (duration of all false and missed calls)
N=Total number of detectors observed

660-2.2.1.1.1 Early Morning Vehicle Presence Detection Accuracy for a Single Detector Expressed as a Percentage:

$$PA_{EM,\det_i} = 100 - \frac{\left| TT_{EM,\det_i} - CET_{EM,\det_i} \right|}{TT_{EM,\det_i}} x100$$

where:

$PA_{EM,\det_i}$ = Presence detection accuracy of detector *i* during the early morning period.

$TT_{EM,\det_i}$ = Total time that detector *i* was monitored (for instance, the 15-minute minimum duration specified in Table 660-1 for the early morning period).

$CET_{EM,\det_i}$ = Cumulative time that detector *i* was in an error state (indicating a detection with no vehicle present or not indicating a detection when vehicle present) during the monitoring period using human observation or another method approved by the Engineer.

The period accuracy will be the arithmetic mean of all individual detector accuracies.

In the equation in 660-2.2.1.1.2, "EM" represents the early morning period and "*N*" is the total number of detectors tested. Substitute other periods as necessary to determine the accuracy for each period (i.e., dawn, AM peak, late AM off-peak, etc.).

660-2.2.1.1.2 Early Morning Vehicle Presence Detection Accuracy for All Detectors Expressed as a Percentage:

$$PA_{EM} = \left(\frac{\sum_{i=1}^{N} PA_{EM,\det_i}}{N} \right)$$

Where:

PA_{EM} = Average accuracy of all detectors during the early morning.

$PA_{EM,\det_i}$ = Accuracy of detector *i* during early morning.

Calculate the roadway segment accuracy over all periods using the equation in 660-2.2.1.1.3.

660-2.2.1.1.3 Total Vehicle Presence Detection Accuracy for All Detectors Expressed as a Percentage:

$$\boxed{PA_{Total} = \frac{\left[PA_{EM} x24 + PA_{DA} x2 + PA_{AMP} x4 + PA_{LAOP} x16 + PA_{NO} x4 + PA_{AOP} x16 + PA_{PMP} x4 + PA_{DU} x2 + PA_{NI} x24\right]}{96}}$$

Where:

PA_{Total} =Accuracy for all detectors for all periods
PA_{EM} = Accuracy of all detectors during early morning traffic conditions
PA_{DA} = Accuracy of all detectors during dawn traffic conditions
PA_{AMP} = Accuracy of all detectors during AM peak traffic conditions
PA_{LAOP} = Accuracy of all detectors during late AM off-peak traffic conditions
PA_{NO} = Accuracy of all detectors during noon traffic conditions
PA_{AOP} = Accuracy of all detectors during afternoon off-peak traffic conditions
PA_{PMP} = Accuracy of all detectors during PM peak traffic conditions
PA_{DU} = Accuracy of all detectors during dusk traffic conditions
PA_{NI} = Accuracy of all detectors during night traffic conditions

660-2.2.1.2 Vehicle Presence Detection System Field Acceptance Testing: Verify presence detection accuracy at installed field sites using a reduced method similar to that described in 660-2.2.1.1. Compare sample data collected from the detection system with ground truth data collected by human observation. For site acceptance tests, collect samples and ground truth data for each site for a minimum of five minutes during a peak period and five minutes during an off-peak period. For presence detection at intersections, ensure there are a minimum of three detections for each signal phase. Perform site acceptance tests in the presence of the Engineer.

660-2.3 Traffic Data Detection System Performance Requirements: Provide a vehicle detection system capable of meeting the minimum total roadway segment accuracy levels of 95% for volume, 90% for occupancy, and 90% for speed for all lanes, up to the maximum number of lanes that the device can monitor as specified by the manufacturer.

660-2.3.1 Data Accuracy: To verify conformance with the accuracy requirements in this Section and as a precondition for listing on the APL, sample data collected

from the vehicle detection system will be compared against ground truth data collected during the same time by human observation or by another method approved by the TERL. Ensure sample data is collected over several time periods under a variety of traffic conditions. Weight each data sample to represent the predominant conditions over the course of a 24-hour period. Samples will consist of 15- and 30-minute data sets collected at various times of the day. Representative data periods and their assigned weights are provided in Table 660-1.

660-2.3.1.1 Calculation of Volume Accuracy: Determine individual lane volume accuracy per period by subtracting from 100 percent the absolute difference of the total volume measured by the detector and the ground truth volume measurement, divided by the ground truth volume measurement, expressed as a percentage.

In the equation in 660-2.3.1.1.1, "EM" represents the early morning period. The subscript "*i*" represents a lane at the detection zone on the roadway segment and could vary from 1,…, N, where "N" is the maximum number of lanes being detected. Substitute other lane numbers and periods as necessary to determine the accuracy for each lane during each period (i.e., dawn, AM peak, late AM off-peak, etc.).

Variables and subscripts used in the equations below are identified as follows:

VT = Total volume

VD = Vehicle detection data (in this case, count data)

GT = Ground truth measurement utilizing a reliable method approved by the Engineer.

VA = Volume accuracy

660-2.3.1.1.1 Early Morning Volume Accuracy for a Lane Expressed as a Percentage:

$$VA_{EM,\ln_i} = 100 - \frac{\left| VT_{EM,VD,\ln_i} - VT_{EM,GT,\ln_i} \right|}{VT_{EM,GT,\ln_i}} x100$$

Where:

VA_{EM,ln_i} = Volume accuracy for early morning traffic conditions in the ith lane.

VT_{EM,VD,ln_i} = Total volume for the 15-minute early morning period using the vehicle detector in the ith lane.

VT_{EM,GT,ln_i} = Total volume for the 15-minute early morning period in the ith lane using human observation or another method approved by the Engineer.

The period volume accuracy will be the arithmetic mean of the lane volume accuracy over all lanes.

In the equation in 660-2.3.1.1.2, "EM" represents the early morning period and "*N*" is the total number of lanes of detection on the roadway segment under test. Substitute other periods as necessary to determine the accuracy for each period (i.e., dawn, AM peak, late AM off-peak, etc.).

660-2.3.1.1.2 Early Morning Volume Accuracy Expressed as a Percentage:

$$VA_{EM} = \left(\frac{\sum_{i=1}^{N} VA_{EM,\ln_i}}{N} \right)$$

Where:

VA_{EM} = Average volume accuracy for early morning traffic conditions for all lanes.

VA_{EM,ln_i} = Volume accuracy for early morning traffic conditions in the i th lane.

Calculate the total volume accuracy over all periods using the equation in 660-2.3.1.1.3.

660-2.3.1.1.3 Total Volume Accuracy Expressed as a Percentage:

$$\boxed{VA_{Total} = \frac{\left[VA_{EM}x24 + VA_{DA}x2 + VA_{AMP}x4 + VA_{LAOP}x16 + VA_{NO}x4 + VA_{AOP}x16 + VA_{PMP}x4 + VA_{DU}x2 + VA_{NI}x24\right]}{96}}$$

Where:

VA_{Total} = Volume accuracy for all lanes for all periods
VA_{EM} = Volume accuracy for early morning traffic conditions
VA_{DA} = Volume accuracy for dawn traffic conditions
VA_{AMP} = Volume accuracy for AM peak traffic conditions
VA_{LAOP} = Volume accuracy for late AM off-peak traffic conditions
VA_{NO} = Volume accuracy for noon traffic conditions
VA_{AOP} = Volume accuracy for afternoon off-peak traffic conditions
VA_{PMP} = Volume accuracy for PM peak traffic conditions
VA_{DU} = Volume accuracy for dusk traffic conditions
VA_{NI} = Volume accuracy for night traffic conditions

660-2.3.1.2 Calculation of Speed and Occupancy Accuracy: Calculate speed accuracy as discussed in this subarticle. Calculate occupancy accuracy using similar methods.

For computing the accuracy of the detector speed measurement, the average speed readings obtained from the detection system are compared to ground truth values.

The equation in 660-2.3.1.2.1 represents the ground truth average speed computation procedure for a particular lane during a specific time period. The equation in 660-2.3.1.2.2 represents the average speed computation procedure for a particular lane during a specific time period using data gathered from the detection system.

In the equations in 660-2.3.1.2.1 and 660-2.3.1.2.2, the time period described is the early morning period, represented by “EM”, and the subscript “k” represents a vehicle traveling on the roadway and could vary from 1,…, K, where “K” is the total number of vehicles in lane i during the time period under consideration. The subscript “i” represents a lane in a roadway and could vary from 1,…, N, where “N” is the total number of lanes of detection on the roadway segment. Substitute other lanes and periods as necessary and compute the accuracy for each lane for all time periods.

Variables and subscripts used in the equations below are identified as follows:

SA = Speed accuracy
S = Speed of an individual vehicle
K= Total number of vehicles in lane during time period
veh = Vehicle

660-2.3.1.2.1 Early Morning Average Ground Truth Speed:

$$S_{Avg,EM,GT,\ln_i} = \frac{1}{K}\sum_{k=1}^{K} S_{EM,GT,\ln_i,veh_k}$$

Where:

SA_{Avg,EM,GT,ln_i} represents the average ground truth vehicle speed for the *i* th lane during the early morning period.

S_{EM,GT,ln_i,veh_k} represents the ground truth speed for the *k*th vehicle in the *i*th lane during the early morning period using human observation or another method approved by the Engineer.

660-2.3.1.2.2 Early Morning Average Vehicle Detector Speed:

$$S_{Avg,EM,VD,\ln_i} = \frac{1}{K}\sum_{k=1}^{K} S_{EM,VD,\ln_i,veh_k}$$

Where:

S_{Avg,EM,VD,ln_i} represents the average speed recorded by the vehicle detector for the ith lane during the early morning period.

S_{EM,VD,ln_i,veh_k} represents the speed for the k th vehicle in the i th lane during the early morning period using the vehicle detector.

Determine lane speed accuracy per period by subtracting from 100 percent the absolute difference of the average lane speed measured by the detector and the average lane ground truth speed, divided by the average lane ground truth speed, expressed as a percent.

In the equation in 660-2.3.1.2.3, "EM" represents the early morning period. The subscript "*i*" represents a lane of detection on a roadway and could vary from 1,…,N, where "N" is the total number of lanes of detection on the roadway segment. Substitute other lanes as necessary to determine the accuracy for each period (i.e., dawn, AM peak, late AM off-peak, etc.).

660-2.3.1.2.3 Early Morning Lane Speed Accuracy Expressed as a Percentage:

$$SA_{Avg,EM,\ln_i} = 100 - \frac{\left|S_{Avg,EM,VD,\ln_i} - S_{Avg,EM,GT,\ln_i}\right|}{S_{Avg,EM,GT,\ln_i}} \times 100$$

Where:

SA_{Avg,EM,ln_i} represents the average speed accuracy during early morning traffic conditions for all vehicles that traveled in lane i of the roadway segment.

The period speed accuracy will be the arithmetic mean of the lane speed accuracy, computed using the equation in 660-2.3.1.2.3, over all lanes.

In the equation in 660-2.3.1.2.4, "EM" represents the early morning period. The subscript "i" represents a lane of detection on a roadway and could vary from 1,…, N, where "N" is the maximum number of lanes on the roadway segment. Substitute data as necessary to determine the accuracy for each period (i.e., dawn, AM peak, late AM off-peak, etc.).

660-2.3.1.2.4 Early Morning Speed Accuracy Expressed as a Percentage:

$$SA_{EM} = \left(\frac{\sum_{i=1}^{N} SA_{Avg,EM,\ln_i}}{N} \right)$$

Where:

SA_{EM} represents the average speed accuracy during early morning traffic conditions for all lanes of detection on the roadway segment.

Calculate detector speed accuracy for the roadway segment over all periods using the equation in 660-2.3.1.2.5.

660-2.3.1.2.5 Total Roadway Segment Accuracy Expressed as a Percentage:

$$SA_{Total} = \frac{[SA_{EM}x24 + SA_{DA}x2 + SA_{AMP}x4 + SA_{LAOP}x16 + SA_{NO}x4 + SA_{AOP}x16 + SA_{PMP}x4 + SA_{DU}x2 + SA_{NI}x24]}{96}$$

Where:

SA_{Total} = Speed accuracy for all lanes for all periods
SA_{EM} = Speed accuracy for early morning traffic conditions
SA_{DA} = Speed accuracy for dawn traffic conditions
SA_{AMP} = Speed accuracy for AM peak traffic conditions
SA_{LAOP} = Speed accuracy for late AM off-peak traffic conditions
SA_{NO} = Speed accuracy for noon traffic conditions
SA_{AOP} = Speed accuracy for afternoon off-peak traffic conditions
SA_{PMP} = Speed accuracy for PM peak traffic conditions
SA_{DU} = Speed accuracy for dusk traffic conditions
SA_{NI} = Speed accuracy for night traffic conditions

660-2.3.1.3 Traffic Data Detection System Field Acceptance Testing: Verify detector data accuracy at installed field sites using a reduced method similar to those described in 660-2.3.1. Compare sample data collected from the detection system with ground truth data collected by human observation. For site acceptance tests, collect samples and ground truth data for each site for a minimum of five minutes during a peak period and five minutes during an off-peak period. Perform site acceptance tests in the presence of the Engineer.

660-2.4 Probe Data Detection System Performance Requirements: Ensure that probe data detectors establish a unique and consistent identifier for each vehicle detected and the time and location that the vehicle was detected. Ensure that probe detectors provide a minimum penetration rate of 75%. Ensure probe data detection systems that match upstream and

downstream detection of the same vehicle provide a minimum match rate of 5%. Ensure probe data detection systems meet a minimum total roadway segment speed and travel time accuracy level of 90%. Verify system performance over several time periods under a variety of traffic conditions as described in 660-2.2.1.

660-2.4.1 Calculation of Penetration Rate: Penetration rate is defined as the volume of vehicles detected, identified, and time stamped divided by the number of qualified vehicles that passed within the detection area of the probe detector.

660-2.4.1.1 Early Morning Penetration Rate Expressed as a Percentage:

$$PR_{EM} = 100 - \frac{\left|R_{EM,VD} - V_{EM,GT}\right|}{V_{EM,GT}} \times 100$$

Where:

PR_{EM} = Penetration Rate for early morning.

$R_{EM,VD}$ = Number of unique vehicle records captured by the vehicle detector.

$V_{EM,GT}$ = Total volume of vehicles that pass the detection area for the 15-minute early morning period using human observation or another method approved by the Engineer.

660-2.4.1.2 Calculation of Match Rate: Match rate is the percentage of the total vehicle population of a road segment that is detected and matched at consecutive probe data detection sites.

660-2.4.1.2.1 Early Morning Match Rate Expressed as a Percentage:

$$MR_{EM} = 100 - \frac{\left|M_{EM,VD} - V_{EM,GT}\right|}{V_{EM,GT}} \times 100$$

Where:

MR_{EM} = Match Rate for early morning.

$M_{EM,VD}$ = Number of matched detections between two probe vehicle detection sites (typically a pair of sites at each end of a roadway segment) during early morning.

$V_{EM,GT}$ = Total volume of vehicles that pass the detection area for the 15-minute early morning period using human observation or another method approved by the Engineer.

660-2.4.1.3 Calculation of Probe Data Detection System Speed and Travel Time Accuracy: Calculate speed and travel time accuracy by comparing the speeds and travel times reported by the system against ground truth collected through human observation or another method approved by the Engineer.

660-3 Installation Requirements.

660-3.1 Installation Requirements for all detectors: Install, configure, and demonstrate a fully functional vehicle detection system as shown in the Plans. Connect all field equipment to the existing communication network, and provide all materials specified in the Contract Documents. Install all equipment according to the manufacturer's recommendations.

Ensure that above-ground detectors can be mounted on existing poles or sign structures, or on new poles, as shown in the Plans. Furnish all equipment with the appropriate power and communication cables. Install the power cable and the communication cables according to the manufacturer's recommendation. Ensure that the cables comply with NEC

sizing requirements and meet all other applicable standards, specifications, and local code requirements.

Do not install communication cables in the same conduit or pull boxes as power cables carrying voltage greater than 24 V_{DC}/V_{AC} or current in excess of 1.5 amps.

Cut all wires to their proper length before assembly. Do not double back any wire to take up slack. Neatly lace wires into cables with nylon lacing or plastic straps. Secure cables with clamps and provide service loops at all connections.

In the event that power to the vehicle detection system or a subcomponent thereof is interrupted, ensure that the equipment automatically recovers after power is restored. Ensure that all programmable system settings return to their previous configurations and the system resumes proper operation.

660-3.2 Inductive Loop Detector Installation: Install vehicle loops in accordance with the manufacturer's instructions and the Design Standards, Index No. 17781.

660-3.2.1 Inductive Loop-Detector Units: Adjust the operating frequency of each detector unit, if required, to prevent crosstalk of the units.

660-3.2.2 Saw Cuts: Use a chalk line or equivalent method to outline the perimeter of the loop on the pavement and routes for lead-in cables. Do not allow the saw cut in the pavement to deviate by more than 1 inch from the chalked line. Ensure that all saw cuts are free of any dust, dirt, or other debris and completely dry prior to installation of the loop wire, loop wire twisted pair lead, or lead-in cable.

Ensure that the top conductor of the loop wire or lead-in cable is a minimum of 1 inch below the final surface of the roadway.

660-3.2.3 Loop Wire: Ensure that all loops are wound in a clockwise manner and the first turn of the loop wire is placed in the bottom of the saw cut, with each subsequent turn placed on top of the preceding turn. Push the loop wire to the bottom of the saw cut with a non-metallic tool which will not damage the insulation.

Tag and identify the clockwise "lead" of each loop.

Use alternate polarity on adjacent loops.

Ensure that the hold down material is non-metallic, is placed in the saw slot using segments 1 to 2 inches long, spaced 12 inches apart, and that the distance from the top of the hold down material to the final surface of the roadway is not less than 1-1/2 inches.

660-3.2.4 Loop Wire Twisted Pair Lead: Create a loop wire twisted pair lead by twisting the loop wire pair a minimum of 10 turns per foot to form a loop wire twisted pair lead from the edge of the loop to the pull box located adjacent to the roadway. Place only one loop wire twisted pair lead in a saw cut. Ensure that the distance between a twisted loop wire pair lead within the roadway is a minimum of 6 inches from any other twisted loop wire pair lead or loop, until they are within 1 foot of the edge of pavement or curb, at which point they may be placed closer together.

Provide a minimum of 3 feet of twisted loop wire pair lead in the pull box located adjacent to the roadway. Do not route twisted loop wire pair lead directly through conduits to the cabinet, unless otherwise shown in the Plans.

660-3.2.5 Loop Sealant: Prepare and apply loop sealant in accordance with the manufacturer's instructions. Ensure that the loop sealant has cured completely before allowing vehicular traffic to travel over the sealant.

660-3.2.6 Shielded Lead-in Cable: Place the lead-in cable in the bottom of the saw cut. Do not damage the insulation.

Install no more than four lead-in cables in a saw cut. Ensure that the hold down material is not longer than 1 inch and that the distance from the top of the hold down material to the final surface of the roadway is not less than 1-1/2 inches.

660-3.2.7 Splicing: Perform the splicing in a pull box located off the roadway, not in the roadway itself.

Splice the black conductor of the lead-in cable to the clockwise "lead" of the loop.

Ensure that the ends of the cable jackets, twisted pair, and lead-in are encased in the loop splice material.

Ensure that each loop has an individual return to the cabinet and series splicing is performed on a separate terminal block in the cabinet.

660-3.2.8 Terminations: Using insulated terminal lugs, terminate lead-in cables or twisted pair loop wire on a terminal strip, which is located in the controller or detector cabinet. Use a calibrated ratchet type crimping tool to attach the lugs to the conductors of the lead-in cable or twisted loop wire.

660-3.2.9 Loop Assembly Identification: Identify and tag each loop assembly in the controller or detector cabinet by lane and movement number.

660-3.2.10 Inductive Loop Detector Testing and Turn-on:

660-3.2.10.1 Series Resistance: Obtain Department of Transportation Traffic Signal Resistance Measurement Data Sheets from the Engineer. Measure and record the series resistance of each loop assembly on these data sheets. Leave a copy in the controller cabinet.

If the series resistance of a loop assembly is greater than 10 Ω, inspect the loop assembly to find the cause of the excessive resistance. Correct the cause of the excessive resistance at no additional cost to the Department.

660-3.2.10.2 Insulation Resistance: Measure and record the insulation resistance of each loop assembly and verify that the resistance is greater than 100 MΩ. Use a 500 V_{DC} insulation tester to measure the resistance. Reference all measurements to a good earth ground (ground rod, metallic water pipe, etc.). Disconnect the transient suppression devices from the loop assemblies before taking any measurements. If the insulation resistance is less than 100 MΩ, determine if the lead-in cable or the loop wire is causing the problem, and replace the defective cable or loop wire at no additional cost to the Department.

660-3.2.10.3 Loop Detector Turn-on: Connect the loop assemblies to the appropriate inductive loop vehicle detectors and tune the detectors in accordance with the manufacturer's instructions. Separate the operating frequencies of vehicle detectors, in adjacent lanes, by at least 2 kHz. Verify operation proper operation in accordance with 660-2.2.1.2.

660-3.3 Video Detector Installation: Install cameras and configure detection zones and settings in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer. Submit configuration settings (including, but not limited to, detector names, communication settings, and output assignments) and configuration file backups to the Engineer. Submit a graphical depiction of each camera site, its pole location, mounting height, the ratio of distance away from the camera versus the mounting height, the camera's mounting type (i.e., pole or structure), camera aiming procedures, and the placement of the proposed detection zone for each lane.

Do not use coaxial cable runs in excess of 500 feet. Mount and aim cameras in a manner that eliminates as much environmentally generated glare as possible.

660-3.4 Microwave Detector Installation: Install detector and configure detection zones and settings in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer. Submit configuration settings (including, but not limited to, detector names, communication settings, and output assignments) and configuration file backups to the Engineer.

660-3.5 Wireless Magnetometer Installation: Install in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer. Ensure that materials used for the installation of magnetometers in the road surface have cured completely before allowing vehicular traffic to travel over them.

660-3.6 AVI Detector Installation: Install in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer.

660-4 Warranty.

Ensure that the detection system has a manufacturer's warranty covering defects for a minimum of 2 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.

660-5 Method of Measurement.

The Contract unit price for each inductive loop detector and per assembly for loop assembly will include all equipment, materials as specified in the Contract Documents, and all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation.

The Contract unit price for each component of an MVDS, VVDS, WMDS, or AVI detection system will include furnishing, placement, and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software packages and firmware, supplies, support, personnel training, shop drawings, warranty documentation, and incidentals necessary to complete the work.

660-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. Payment will be made under:

Item No. 660-1	Inductive Loop Detector – each.
Item No. 660-2	Loop Assembly – per assembly.
Item No. 660-3	Vehicle Detection System - Microwave – each.
Item No. 660-4	Vehicle Detection System – Video – each.
Item No. 660-5	Vehicle Detection System – Wireless Magnetometer – each.
Item No. 660-6	Vehicle Detection System - AVI – each.

SECTION 665
PEDESTRIAN DETECTION SYSTEM

665-1 Description.

Install a pedestrian detection system. Use pedestrian detection systems and components listed on the Department's Approved Product List (APL). Pedestrian detection systems are classified into two categories: Standard Pedestrian Pushbutton Detectors and Accessible (Audible/Tactile) Pedestrian Pushbutton Detectors. The components of the pedestrian detection system include pushbuttons, pedestrian actuation signs, electronics, wiring, and mounting hardware.

665-2 Materials.

665-2.1 Standard Pedestrian Pushbutton Detector: Pushbuttons must be raised from or flush with their housings and be a minimum of 2 inches in the smallest dimension. The pushbutton must require no more than 5 pounds of force to activate. The detector must be weather-tight and tamper resistant.

665-2.1.1 Housing: The housing must be a two piece unit consisting of a base housing and a removable cover. The housing must be cast aluminum meeting the physical characteristics and chemical content established in ASTM B26 for alloys S5A and CS72A.

The housing or adapter (saddle) must conform to the shape of a pole and provide a flush, secure fit. Saddles must be of the same material and construction as the housing. Pushbuttons for wood pole mounting must have threaded holes for 1/2 inch conduit provided in the housing top or bottom. A 3/4 inch hole with an insulated bushing shall be provided through the back of the housing. Unused openings shall be closed with a weatherproof closure and painted to match the housing.

The housing must have a powder-coat finish and painted in accordance with Military Standard MIL-PRF-24712A. The housing must be permanently marked with manufacturer name or trademark, part number, date of manufacture, and serial number.

665-2.1.2 Pushbutton: The pushbutton must include a normally open, mechanical phenolic enclosed, positive-acting, spring-loaded, snap-action switch with single pole, single throw contacts or Piezo driven solid state switch rated for a minimum of 50 V. The switch, when activated, must give an audible (i.e., click) or visual indication of actuation. Switch connections inside the housing must allow wiring and installation without binding. The switch must have a design life of one million operations (minimum) at rated load.

665-2.1.3 Electrical Requirements: The wiring must be No. 18 AWG stranded (minimum) with 600 V outdoor insulation rating.

665-2.2 Accessible (Audible/Tactile) Pedestrian Pushbutton Detector: The accessible pedestrian pushbutton detector must consist of all electronic control equipment, wiring, mounting hardware, pushbuttons, and pedestrian actuation signs designed to provide both a pushbutton with a raised, vibrating tactile arrow on the button as well as a variety of audible indications for differing pedestrian signal functions.

665-2.2.1 Electronic Control Equipment: The accessible pedestrian pushbutton detector must include electronic control equipment that is programmable and adjustable using a laptop computer or vendor supplied programmer. Electronic control equipment must be able to be installed within a traffic controller cabinet or within a pedestrian signal housing. Electronic control equipment installed within a traffic controller cabinet must allow the use of up to

16 pushbuttons (4 maximum per channel) with a single traffic controller cabinet. The accessible pedestrian pushbutton detector must receive timing from Walk and Don't Walk signals.

665-2.2.1.1 Audible Messages: Audible messages must be programmable. All audible messages and tones must emanate from the accessible pedestrian pushbutton housing. The accessible pedestrian pushbutton detector must utilize digital audio technology. The system shall have, at a minimum, three programmable locator tones. The accessible pedestrian pushbutton detector must have independent minimum and maximum volume limits for the Locator Tone, Walk, and Audible Beaconing features. The Wait message must only annunciate once per actuation.

665-2.2.1.2 Pushbutton locator tone: The accessible pedestrian pushbutton detector must provide independent ambient sound adjustment for the locator tone feature. The accessible pedestrian pushbutton detector must allow the locator tone to be deactivated.

665-2.2.1.3 Vibrating Pushbutton (VPB): The accessible pedestrian pushbutton detector must include a Vibrating Pushbutton (VPB). The VPB must be a single assembly containing an ADA compliant, vibro-tactile, directional arrow button, weatherproof audible speaker and pedestrian actuation sign with optional placard Braille messages. The VPB tactile arrow must be 2 inches in length, be field adjustable to two directions, and require no more than 5 pounds of applied force to activate.

665-2.2.1.4 Conflict Monitoring: The accessible pedestrian pushbutton detector must monitor the Walk condition for conflict operation. The accessible pedestrian detector system must disable the Walk functionality if a conflict is detected.

665-2.2.1.5 Cabinet Control Unit (CCU): The accessible pedestrian pushbutton detector may include a CCU for interfacing and connecting the system. The CCU shall have labeled LED indicators for each channel operation. The CCU must reset upon loss of internal communication.

665-2.2.2 Inputs and Outputs: All inputs and outputs must use Mil-Spec Multi-pin connectors.

665-2.2.2.1 Inputs: Walk and Don’t Walk inputs must be optically isolated 80-150 volts AC/DC, 5mA max. General purpose inputs must be optically isolated 10-36 volts AC/DC, 10mA max.

665-2.2.2.2 Outputs: Outputs must be optically isolated 36 volts AC/DC peak, 300mA solid state fused contact closures. CCUs must include a normally open relay contact fault output.

665-2.2.3 Communication: The CCU must include an Ethernet interface. The CCU must have an integral web server that provides information on audible/tactile pedestrian-pushbutton detector status, access to event logs, and provides for remote Configuration of accessible pedestrian pushbutton detector system options. VPBs must include an Ethernet, serial, or USB programming interface.

665-2.3 Electrical: All wiring must meet applicable NEC requirements. The accessible pedestrian pushbutton detector must operate using a nominal input voltage of 120 volts alternating current (VAC). If any device requires nominal input voltage of less than 120 VAC, furnish the appropriate voltage converter.

Accessible pedestrian pushbutton detector control electronics that are mounted in a pedestrian signal head must be able to receive power from the Walk and Don’t Walk circuits of the signal head. Control electronics shall not require more than four wires for each pushbutton

connection, and no more than two wires for each controller pedestrian input. Voltage at the pushbutton shall not exceed 24 VAC.

665-2.4 Mechanical: Equipment must be permanently marked with manufacturer name or trademark, part number, date of manufacture, and serial number. Do not use self-tapping screws on the exterior of the assembly.

Ensure that all parts are made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. Ensure that all assembly hardware, including nuts, bolts, external screws and locking washers less than 5/8 inch in diameter, are Type 304 or 316 passivated stainless steel. Stainless steel bolts, screws and studs must meet ASTM F593. Nuts must meet ASTM F594. All assembly hardware greater than or equal to 5/8 inch in diameter must be galvanized. Bolts, studs, and threaded rod must meet ASTM A307. Structural bolts must meet ASTM A325.

Enclosures must have a NEMA 4X rating. Pushbutton housings for intersections must be black.

665-2.5 Environmental: Ensure equipment performs all required functions during and after being subjected to the environmental testing procedures described in NEMA TS2, Sections 2.2.7, 2.2.8, and 2.2.9.

665-3 Warranty.

Ensure that pedestrian detection systems have a manufacturer's warranty covering defects for a minimum of 5 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608. Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.

665-4 Installation.

Install pedestrian detectors at the locations and in a manner as shown in the Plans and Design Standards, Index No. 17784. Ensure all detectors are the same manufacturer and model.

Pushbuttons mounted on wood poles must be serviced by a conduit riser. Pushbuttons mounted on steel or aluminum (poles, pedestals, or posts) must be serviced by wiring inside the pole. Pushbuttons mounted on existing concrete poles may be serviced by a conduit riser. Pushbuttons mounted on new concrete poles or pedestals must be serviced by wiring on the inside.

A pedestrian actuation sign must be included with each pushbutton assembly. Provide the sign type, size and legend as specified on the plans or as directed. Tactile arrows of accessible pedestrian pushbuttons must align parallel with the direction of the crossing.

The Engineer will direct any variation from the locations shown. When mounting, place the detector housing or saddle in complete contact with the pole or controller cabinet. When a post is required in the installation of the pedestrian detector, restore the area around the post to its original condition or as required by the Plans.

665-5 Method of Measurement.

The Contract unit price for pedestrian detectors, will be paid per each, and will include the pedestrian actuation sign, all mounting hardware, wiring, materials and equipment, and all labor and miscellaneous materials necessary for a complete and accepted installation.

Payment for poles, pedestals, and posts will be made under their respective pay item numbers.

665-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 665- 1- Pedestrian Detector - each.

Item No. 646- 1- Pedestrian Detector Post – each.

TRAFFIC CONTROLLER ASSEMBLIES

670-1 Description.

Furnish and install a traffic controller assembly or flashing intersection control beacon controller assembly as shown in the Plans. Meet the requirements of Section 603.

670-2 Materials.

Use a traffic controller assembly or intersection control beacon controller assembly listed on the Department's Approved Product List (APL). Traffic controller assemblies and intersection control beacon controller assemblies must be permanently marked with manufacturer name or trademark, part number and serial number. Markings must be visible after installation.

Provide a traffic controller assembly consisting of a traffic controller, traffic controller accessories (including monitors, load switches, flasher, flash transfer relay, power supplies), and other equipment wired into a controller cabinet to make a complete and operational assembly. All traffic controller assemblies must provide functionality that meets or exceeds operational characteristics, including NTCIP support, as described in NEMA TS-2-2003.

670-2.1 Traffic Controller: Meet the requirements of Section 671.

670-2.2 Traffic Controller Accessories: Meet the requirements of Section 678.

670-2.3 Controller Cabinet: Meet the requirements of Section 676.

670-2.4 Flashing Intersection Control Beacon Controller Assembly: A flashing intersection control beacon controller assembly must consist of a Type 3 flasher wired into a Type 1 controller cabinet to make a complete and operational assembly.

670-3 Installation Requirements.

670-3.1 Controller Cabinets: Meet the requirements of Section 676.

670-3.2 Field Wiring: Meet the requirements of Sections 632 and 676.

670-3.3 Grounding: Meet the requirements of Sections 620 and 676.

670-3.4 Equipment Placement: Install all equipment in the cabinet in accordance with the manufacturer's recommendations.

670-4 Method of Measurement.

The Contract unit price per assembly for traffic controller assembly or intersection control beacon controller assembly will include all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation.

670-5 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 670- 4-	Intersection Control Beacon Controller Assembly - per assembly.
Item No. 670- 5-	Traffic Controller Assembly - per assembly.

SECTION 685
TRAFFIC CONTROL SYSTEM AUXILIARIES

685-1 Description.

Furnish and install traffic control system auxiliaries as shown in the Plans.

685-2 Materials.

685-2.1: General: Use traffic control system auxiliaries listed on the Department's Approved Product List (APL). Equipment must be permanently marked with the manufacturer's name or trademark, model/part number and serial number or date of manufacture.

685-2.2 Uninterruptible Power Supply (UPS): Use a line interactive or online/double-conversion UPS as shown in the Plans. UPS assemblies must be designed for installation in a roadside NEMA 3R enclosure to provide battery backup functionality for traffic control systems, including traffic signal and intelligent transportation system (ITS) devices. UPS assemblies must include batteries provided by the UPS manufacturer or in accordance with manufacturer's requirements.

Loss of utility power, transfer from utility power to battery power, and transfer back to utility power must not interfere with normal operation of connected equipment. In the event of UPS failure or battery depletion, connected equipment must be energized automatically upon restoration of utility power.

The UPS must operate in hot standby mode with power transfer being accomplished in 40 milliseconds or less.

Removal and replacement of the UPS must not disrupt the operation of the equipment being protected.

All harnesses necessary to connect and operate the system must be included. All connectors must be keyed to prevent improper connection.

685-2.2.1 Configuration and Management: Provide a UPS that supports local and remote configuration and management, including access to all user-programmable features as well as alarm monitoring, event logging, and diagnostic utilities.

Configuration and management functions must be password protected.

Alarm function monitoring must include the following: loss of utility power, inverter failure, low battery, battery temperature, and inverter active/utility fail. The UPS must include an event log that indicates the date and time of the following events: AC high, AC low, AC frequency high, AC frequency low, AC fail/blackout, overload, over temperature, battery voltage high, battery voltage low, battery disconnected, battery temperature high, temperature probe disconnected, and short circuit. The UPS event log must be able to store a minimum of 200 events.

The UPS must include a front panel display and controls that allows programming of configurable parameters, features, and functions without the need for another input device. The UPS must have visual indications for Power-On, Mode of Operation (utility power or inverter), Battery Status, Alarm Status, Load Levels, and AC Output Voltage.

685-2.2.2 Communication Interfaces: Provide a serial data connection port and an Ethernet port (RJ45) for local control using a laptop PC and remote control via a network connection.

685-2.2.3 Batteries: Use only AGM or Gel type external batteries. Batteries must be sealed and require no maintenance, cause no corrosion, and be capable of maintaining 80% of original capacity and performance for a minimum of five years.

The UPS must be supplied with a wiring harness for battery connections. The battery wiring harness must allow 6 feet of separation between the UPS and its battery bank. Battery terminals must include a protective covering to prevent accidental spark or shorting.

The UPS must include battery management functions that includes active or equalized balancing; monitoring of temperature, voltage, and amperage of charge and discharge; and temperature compensated automatic charging to maximize the life of the batteries.

685-2.2.4 Electrical: UPS assemblies used to provide backup power in an ITS cabinet must provide a minimum of 350 watts (at $120V_{AC}$) of continuous backup power for a minimum of two hours unless otherwise shown in the Plans.

UPS assemblies used to provide backup power in a traffic signal controller cabinet must provide a minimum 400 watts (at $120V_{AC}$) of continuous power for a minimum of 6.5 hours unless otherwise shown in the Plans.

Frequency must be regulated to 60 Hz, plus or minus 0.5 Hz, while the UPS is supplying power. The UPS must operate on 85 to 154 V_{AC} without requiring assistance from the batteries.

Double-conversion UPS must be capable of simultaneously producing fully regenerated and regulated, conditioned, True Sine Wave power and hot standby AC output, and have a minimum operating efficiency of 90%. Ensure the UPS is listed to the requirements of UL 1778. Upstream back-feed voltage from the UPS must be less than 1 V_{AC}.

685-2.2.5 Traffic Signal UPS Cabinet: Cabinets used to house traffic signal UPS assemblies must be designed to be mounted to the side of a traffic cabinet or base mounted. Cabinets must meet the requirements of Section 676 and must include shelves and rack rails to house all UPS system components including the UPS, batteries, harnesses, switches, surge protective device, power terminal block and a generator hookup with transfer switch. The UPS cabinet must allow a maintenance technician to safely insert power for traffic signal operation while the UPS or associated equipment is serviced or replaced.

A surge protective device must be installed where the supply circuit enters the cabinet in accordance with 620-2.7.1.

The cabinet must include a 20 A, 120 volt, 60 Hz GFCI receptacle. The receptacle must be wired to utility power and not regulated by the UPS module. The cabinet must include a main breaker and a breaker for the technician GFCI outlet.

685-2.2.5.1 Transfer Switch and Generator Access Panel: The cabinet must include a manual transfer switch and generator access panel in accordance with 676-2.6.3. The generator access door must not protrude more than 1 inch when closed.

685-2.2.6 Mechanical: All parts must be made of corrosion-resistant materials such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. All fasteners exposed to the elements must be Type 304 or 316 passivated stainless steel.

685-2.2.7 Environmental: UPS assemblies, including batteries, must provide continuous power with specified wattage and operate properly during and after being subjected to the environmental testing procedures described in NEMA TS 2, Sections 2.2.7, 2.2.8, and 2.2.9.

685-3 Installation.

Install UPS assemblies in accordance with the manufacturer's recommendations. All equipment used to keep the intersection signalized must be backed up and protected by the UPS. Include a UPS operation and maintenance manual in the cabinet where the UPS is installed that includes cabinet wiring schematics, electrical interconnection drawings, parts layout and parts lists.

685-4 Testing.

Provide a field acceptance test plan to the Engineer for approval at least 14 days prior to commencement of testing. After approval of the acceptance test plan, perform testing of the installed UPS equipment. Furnish all equipment, software, and supplies necessary for conducting the test.

685-5 Warranty.

Ensure the UPS includes a manufacturer's warranty covering defects for a minimum of three years (5 years for the external batteries in accordance with 685-2.2.3) from the date of final acceptance in accordance with 5-11 and Section 608. The warranty must include provisions for providing a replacement UPS within 10 calendar days of notification for any UPS found to be defective during the warranty period at no cost to the FDOT or the maintaining agency.

685-6 Method of Measurement.

The Contract unit price for each UPS, furnished and installed, will include furnishing, placement, and testing of all equipment and materials as specified in the Contract Documents, and all tools, labor, operational software packages and firmware, supplies, support, personnel training, shop drawings, documentation (including the field acceptance test plan), and incidentals necessary for a complete and accepted installation.

685-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 685- 1- Uninterruptible Power Supply - each

Appendix C

November 3, 2015

WGI
2035 Vista Parkway, Suite 100
West Palm Beach, Florida 33411

Attn: Mr. Brian LaMotte, P.E.

Re: Geotechnical Engineering Services – Pavement Evaluation Report
NE 2nd Avenue between NW 8th Street and NE 13th Street
Delray Beach, Florida
TSF File No. 7111-15-182

Dear Brian:

Tierra South Florida (TSF), Inc. has completed a pavement evaluation for the above referenced project. This project involves subsurface exploration for pavement roadway improvements on approximately 1,500 feet from NW 8th Street to NW 13th Street in Delray Beach, Florida.

This report contains the data collected during our initial site reconnaissance, presents pavement information from the asphalt cores and recommendation regarding future reconstruction at the referenced roadway. Our findings and laboratory results are attached to this report.

EVALUATION OF EXISTING PAVEMENT

The area was observed to be moderately well drained, although in general the pavement was considered to be in poor to bad condition. The following types of failures, varying on their degree of severity, were observed during this investigation.

1. **Alligator Cracks**: Interconnected cracks forming series of small blocks. Encountered in several areas of the existing pavement surface.

2. **Channels (Ruts):** Channelized depressions usually along the edge of newly installed utilities, which develop in the wheel tracks of an asphalt pavement. Several observed along the corridor.

3. **Edge Cracking:** Edge cracks were observed in the vicinity of some utility cut depressions. Edge cracks are longitudinal cracks, 1-foot or so from the edge of the pavement with or without transverse cracks branching to the shoulder. Usually, edge cracks are due to lack of lateral (shoulder) support. The may also be caused by settlement or yielding of the material underlying the cracked area.

4. **Utility Cuts, Utility Depressions and Patching:** Pavement failures were present through the entire project length related to utility cuts and asphalt patching.

Asphalt Cores and Borings

A total of six (6) asphalt cores were obtained from the existing roadway. Core information is shown in the Appendix. (Pavement Coring Data Sheet). Six (6) auger borings were drilled at each core location. The subsurface conditions, below asphalt and shellrock base, primarily consisted of sandy soils to the boring termination depths.

REPORT LIMITATIONS

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

This geotechnical report has been prepared for the exclusive use of Wantman Group Inc. for the specific application to the NE 2nd Avenue in Delray Beach, Florida.

Very truly yours,

TIERRA SOUTH FLORIDA, INC.

11/3/15

Raj Krishnasamy, P.E.
President
FL Registration No. 53567

11/3/15

Ramakumar Vedula, P.E.
Principal Engineer

APPENDIX

Pavement Coring Data Sheet
Pavement Photos
Boring Location Plan and Soil Profile

PAVEMENT CORING DATA

Page No.:1

Project No.: 7111-15-182

Date: 10/19/15

Name: NE 2ND AVE PAVEMENT EVALUATION FROM GEORGE BUSH BLVD TO NE 13TH ST.

Cored By: Yunisky Rabassa

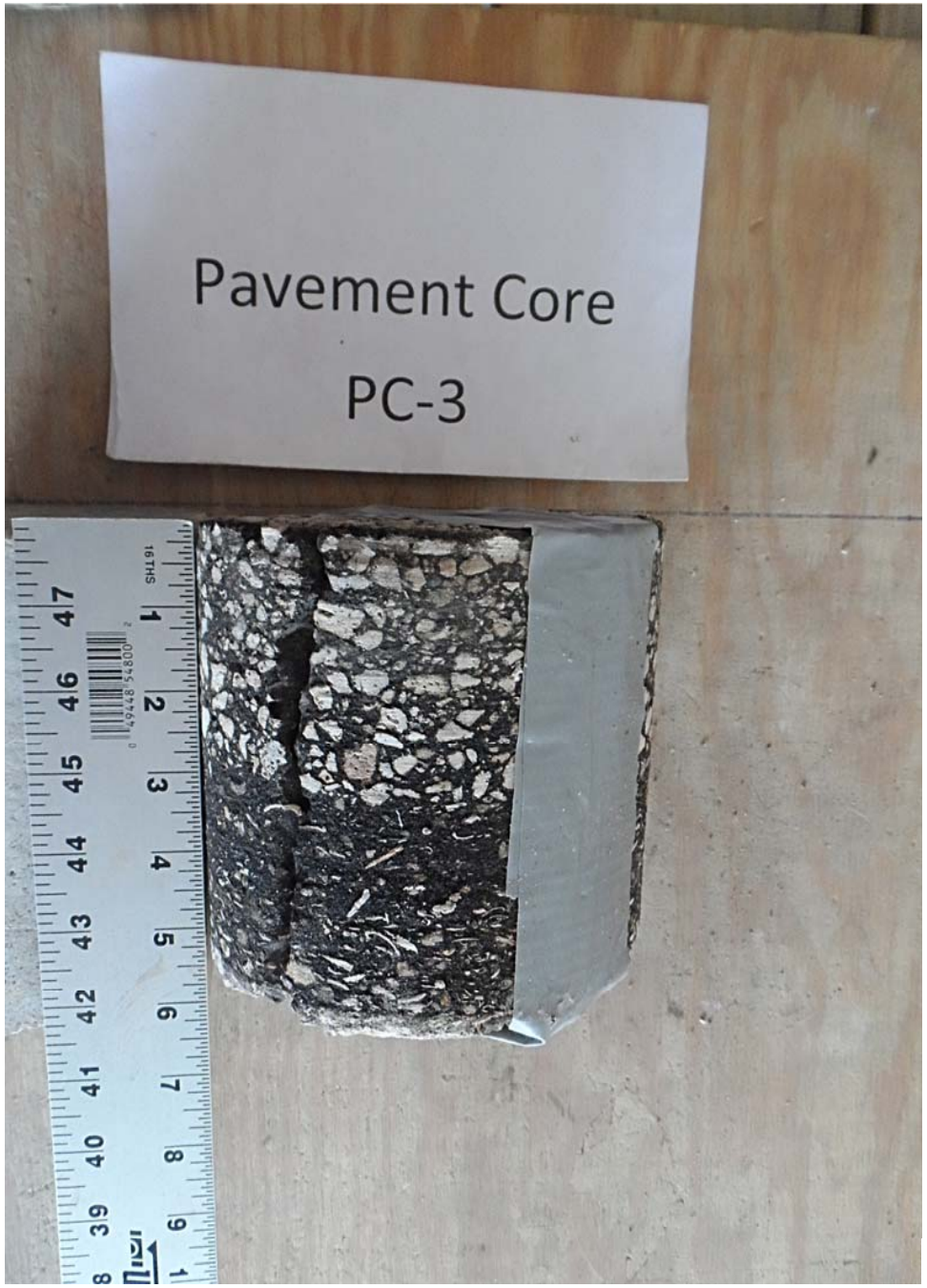
Core No.	Pavement Core Type	Total Core Length (in)	Base		Subgrade		CRACK	Comments
			Type	Thickness (in)	Type	Thickness (in)	Depth (in)	
PC-1	ASPHALT	5	AGGREGATE BASE	8	SAND	>12	5	
PC-2	ASPHALT	4 2/3	AGGREGATE BASE	10	SAND	>12	4 2/3	
PC-3	ASPHALT	5 1/8	AGGREGATE BASE	11 1/2	SAND	>12	5 1/8	
PC-4	ASPHALT	5 1/2	AGGREGATE BASE	12	SILTY SAND TRACE LIMEROCK	6 1/4	5 1/2	
PC-5	ASPHALT	5 1/2	AGGREGATE BASE	14	SAND	>12	2	
PC-6	ASPHALT	5 4/7	AGGREGATE BASE	9	SAND	>12	5 4/7	

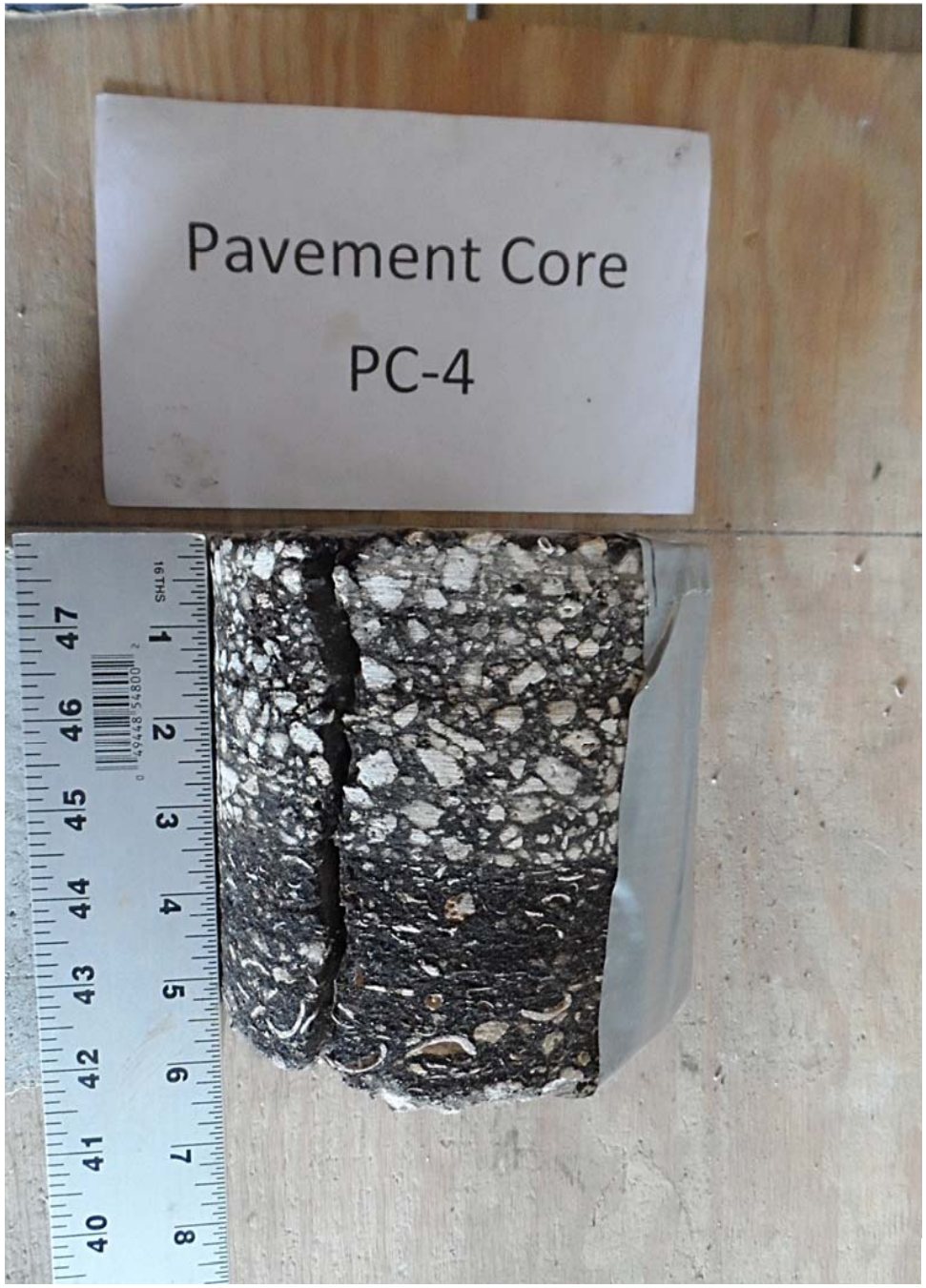
Note: AGGREGATE BASE: SANDY LIMEROCK WITH SHELL

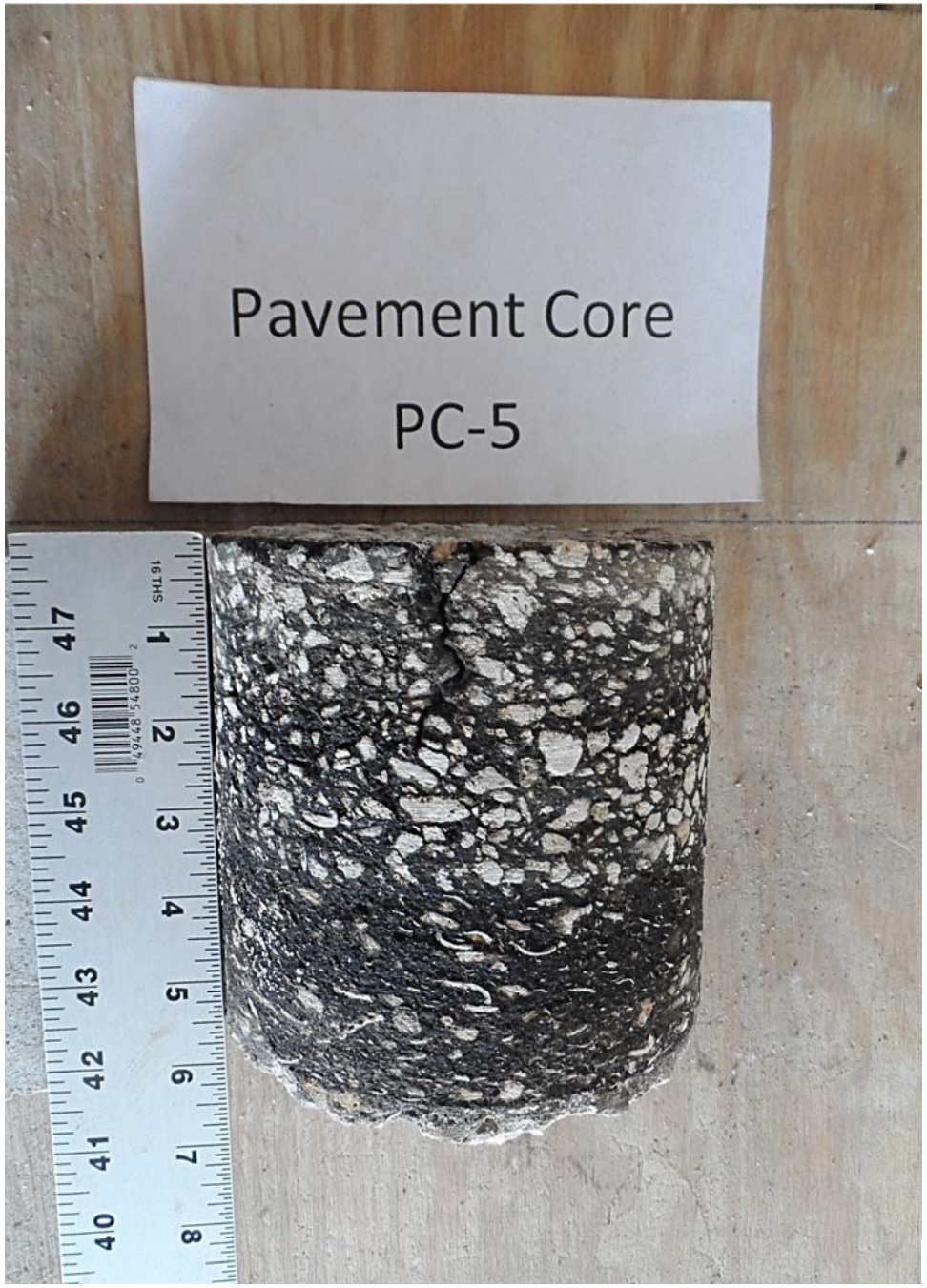

Pavement Core
PC-6

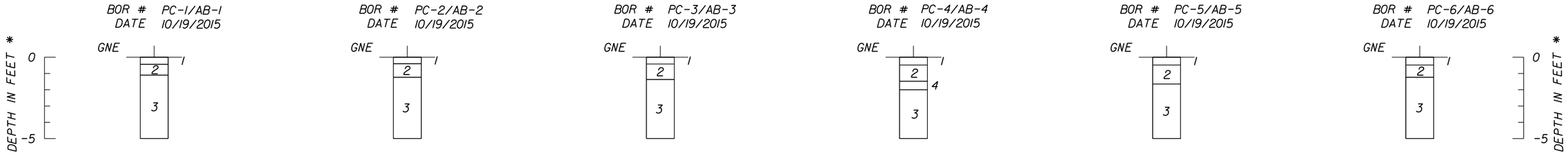

Pavement Core
PC-1

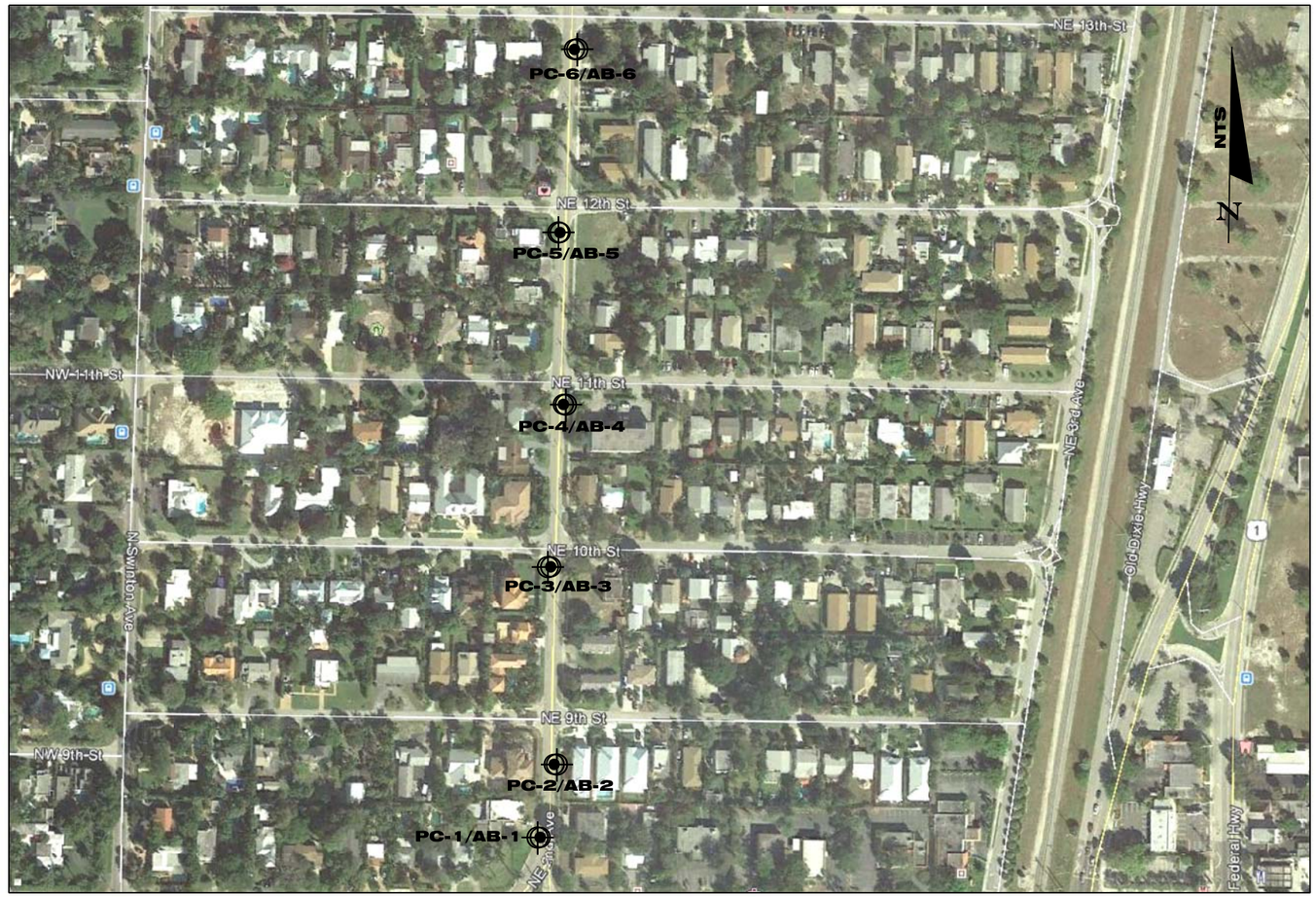

Pavement Core
PC-2


Pavement Core
PC-3


Pavement Core
PC-4


Pavement Core
PC-5





BORING LOCATION PLAN

⊕ Approximate Location of Auger Borings

◉ Approximate Location of Pavement Core

LEGEND

1. ASPHALT
2. LIGHT GRAY SANDY LIMEROCK WITH SHELL (BASE)
3. LIGHT GRAY TO LIGHT BROWN SAND (A-3)
4. GRAY SILTY SAND TRACE LIMEROCK (A-2-4)

NOTES

▽ ENCOUNTERED GROUNDWATER TABLE

N NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUE FOR 12" PENETRATION AND THEY WERE OBTAINED USING AN AUTOMATIC HAMMER. (UNLESS OTHERWISE NOTED.)

* DENOTES DEPTH IN FEET FROM EXISTING GROUND SURFACE

DRAWN BY: NG CHECKED BY: JO	APPROVED BY: RK DATE: 10-22-2015	ENGINEER OF RECORD: RAJ KRISHNASAMY, P.E. FLORIDA LICENSE NO.: 53567	RAJ KRISHNASAMY, P.E. P.E. LICENSE NUMBER 53567 TIERRA SOUTH FLORIDA 2765 VISTA PARKWAY, S-10 WEST PALM BEACH, FL 33411 CERTIFICATE OF AUTHORIZATION 28073	SCALE: NTS	PROJECT NUMBER: 7111-15-182	GEOTECHNICAL ENGINEERING SERVICES NE 2ND AVENUE PAVEMENT EVAUATION FROM GEORGE BUSH BLVD. TO NE 13TH ST. DELRAY BEACH, FLORIDA	Sheet: 1

Appendix D

Department of Engineering and Public Works
P.O. Box 21229
West Palm Beach, FL 33416-1229
(561) 684-4000
FAX: (561) 684-4050
www.pbcgov.com

July 12, 2016

Mr. Isaac Kovner, P.E.
City Engineer
City Of Delray Beach
434 S. Swinton Ave.
Delray Beach, FL 33444

RE: GEORGE W. BUSH BLVD AND NE 2ND AVE/SEACREST AVE SIGNALIZATION PBC INTERSECTION # 51600

Dear Mr. Kovner:

The Traffic Division has reviewed the referenced plans prepared by Wantman Group, Inc., and received on July 11, 2016, and we have no further comments.

Be advised that Palm Beach County Traffic Division will assume the operation and maintenance responsibilities of the traffic signal upon verification by City of Delray Beach and County staff that the signal is designed and built in accordance to City of Delray Beach and Palm Beach County's latest specifications. Upon construction completion, final inspection, and completion of ninety (90) day burn-in period, maintenance will be transferred to Palm Beach County.

If you should have any questions or comments, please contact our office at (561) 684-4030.

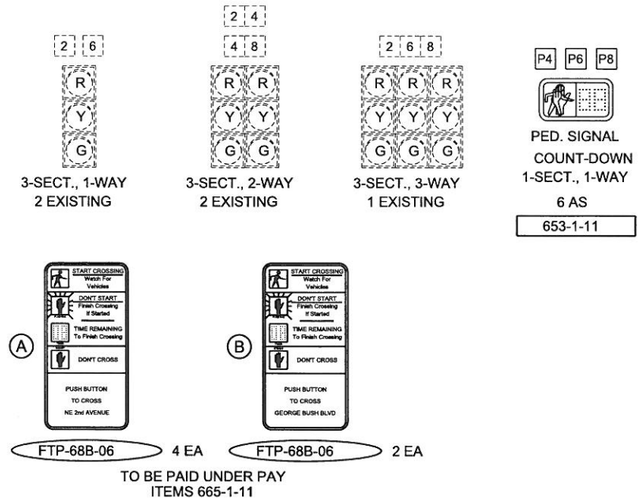
Sincerely,

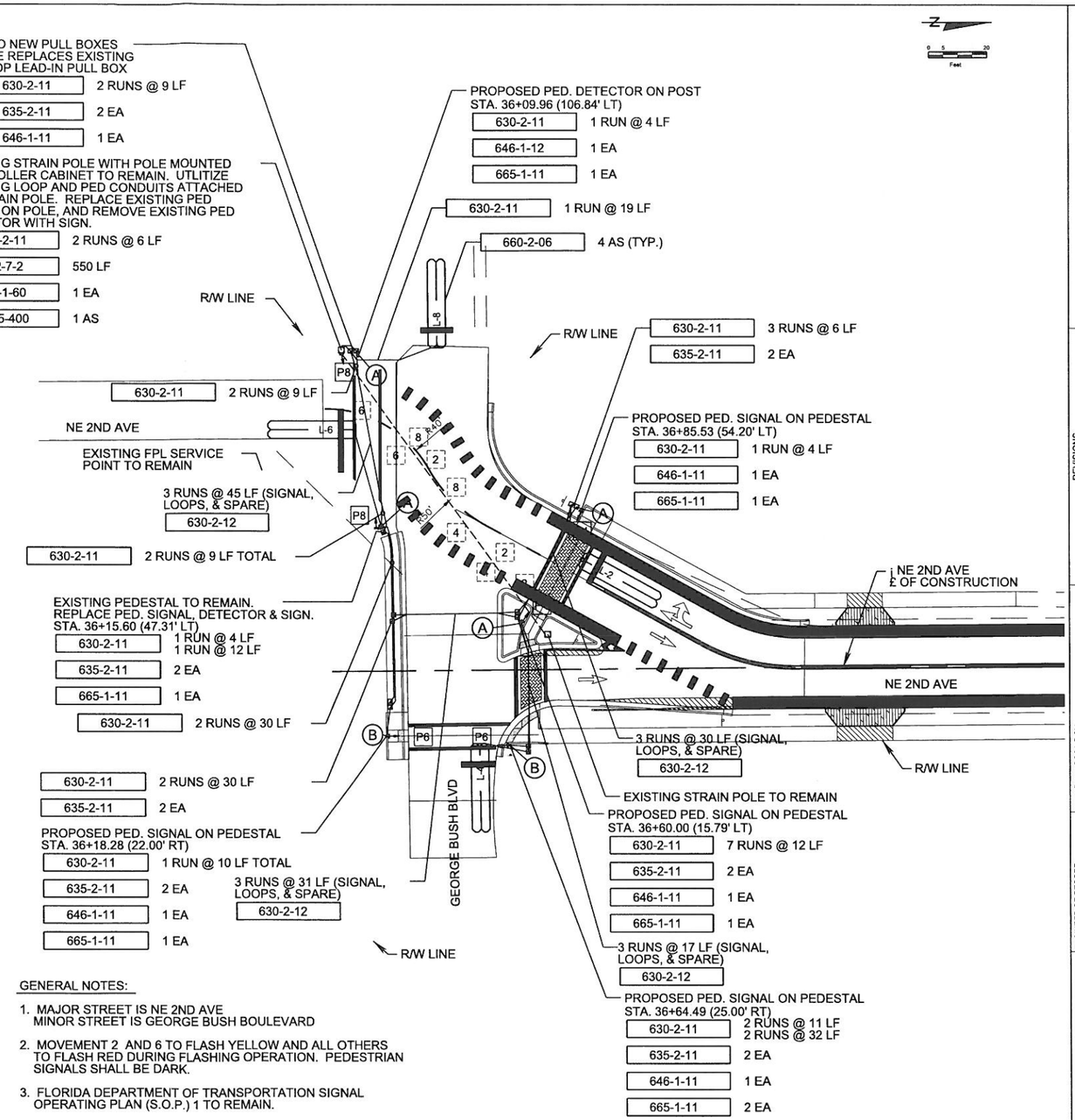
Fatmeh (Fattoush) Jafar, P.E., Ph.D.
Traffic Signal Design Engineer - Traffic Division

FJ:TK:sl

Attachment: Reviewed Signalization Plans
cc: Brett Fuller, P.E. – Project Engineer, Wantman Group, Inc.

File: Intersection - # 51600
N:\TRAFFIC\Signals\Projects\51600 George W. Bush Blvd and NE 2nd Ave\City of Delray Beach - No Comment Letter.doc





SIGNALIZATION PROJECT NOTES:

1. GOVERNING STANDARD FOR SIGNALIZATION DESIGN ARE AS FOLLOWS; FLORDIA DEPARTMENT OF TRANSPORTATION, 2016 DESIGN STANDARDS, 2016 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND PALM BEACH COUNTY TRAFFIC SIGNAL INSTALLATION STANDARDS AND DETAILS DATED 2015.
2. THE AGENCY RESPONSIBLE FOR MAINTENANCE OF THE TRAFFIC SIGNALS AND RELATED ITS COMMUNICATIONS EQUIPMENT IS PALM BEACH COUNTY TRAFFIC ENGINEERING DIVISION (PBCTED). ALL TRAFFIC SIGNAL AND RELATED ITS COMMUNICATION EQUIPMENT WHEN USING PAY ITEM SERIES: 632, 633, 635, 650, 660, 670, 683, 684, 685 AND 686 FOR THIS CONTRACT SHALL BE COMPATIBLE WITH PBCTED'S CENTRAL COMPUTER NETWORK SYSTEM. PRIOR TO ANY PURCHASING OF THE ABOVE PRODUCTS, ENSURE THEY HAVE BEEN APPROVED FOR SYSTEM COMPATIBILITY BY THE MAINTAINING AGENCY.
3. THE CONTRACTOR SHALL MAKE ALL LOOP DETECTORS INSTALLED AS PART OF THE PROJECT FULLY OPERATIONAL IN ACCORDANCE WITH THEIR ASSOCIATED ISOLATED INTERSECTION SIGNAL TIMING CHART WITHIN 24 HOURS OF THEIR INSTALLATION.
4. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY TWO (2) FULL WORKING DAYS IN ADVANCE OF ANY EXCAVATION INVOLVING ITS UTILITIES SO THAT A COMPANY REPRESENTATIVE CAN BE PRESENT. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. SEE UTILITY OWNERS ON ROADWAY GENERAL NOTES.
5. THE CONTRACTOR SHALL PROVIDE FOUR COPIES OF MARKED-UP (AS-BUILT) CONSTRUCTION PLANS, AND ONE CAD FILE OF SUCH, AT THE TIME OF SIGNAL CONDITIONAL ACCEPTANCE INSPECTION BY THE MAINTAINING AGENCY.
6. ALL STANDARD SIGNAL PULL BOXES SHALL BE STAMPED "TRAFFIC SIGNAL". STANDARD SIGNAL PULL BOXES SHALL BE 17"x 30"x 12".
7. THE CONTRACTOR SHALL CONTACT THE PALM BEACH OPERATIONS SIGNALIZATION COORDINATOR FOR ALL SIGNALIZATION INSPECTIONS AT THE PALM BEACH OPERATIONS CENTER - (561) 432-4996.
8. ALL SPLICES OF LOOP WIRE TO LEAD-IN CABLE SHALL BE LOCATED IN PULL BOXES AND SOLDERED AND TAPED WITH A WATERPROOF COATING APPLIED IN A MANNER APPROVED BY THE ENGINEER.
9. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL CONTACT THE PBC TRAFFIC OPERATIONS SUPERINTENDENT, (561) 233-3900, TO INFORM THEM OF CONSTRUCTION OPERATIONS.

SIGNALIZATION PAY ITEM NOTES:

646-1-11: ALL PEDESTALS SHALL BE PROVIDED WITH TRANSFORMER BASES.

670-5-400: INCLUDES COST FOR MINOR CONNECTIONS OF LOOPS AND PEDESTRIAN SIGNALS.

GENERAL NOTES:

1. MAJOR STREET IS NE 2ND AVE
   MINOR STREET IS GEORGE BUSH BOULEVARD
2. MOVEMENT 2 AND 6 TO FLASH YELLOW AND ALL OTHERS TO FLASH RED DURING FLASHING OPERATION. PEDESTRIAN SIGNALS SHALL BE DARK.
3. FLORIDA DEPARTMENT OF TRANSPORTATION SIGNAL OPERATING PLAN (S.O.P.) 1 TO REMAIN.
4. FINAL SIGNAL TIMINGS TO BE PROVIDED BY PALM BEACH COUNTY TRAFFIC ENGINEERING DIVISION.
5. THE EXISTING POWER SERVICE POINT LOCATION IS TO REMAIN.
6. SPEED LIMITS:
   25 MPH - NE 2ND AVE SOUTH
   30 MPH - GEORGE BUSH BOULEVARD
   35 MPH - NE 2ND AVE NORTH
7. MAINTAIN EXISTING L.P.C.

PBC INTERSECTION 51600

WGI
2035 Vista Parkway
West Palm Beach, FL 33411
Phone No. 561.687.2220
Fax No. 561.687.1110
Cert No. 6091 - LB No. 7055
ENGINEERING // SURVEYING // ENVIRONMENTAL // PLANNING

REVISIONS

NO.	DATE	DESCRIPTION	BY

CAD FILANSC01.DGN	
JOB NO. 1004.11	DRAWN CMJ
TOTAL SHEETS 23	DESIGNED CMJ
DATE 2/10/2016	CHECKED KAL
SCALE 1" = 20'	QC BAF

ENGINEER OF RECORD
KEEGAN LARSON, PE
PE# 69178

PROJECT: NE 2ND AVENUE / SEACREST PHASE 1

TASK: SIGNALIZATION PLANS

SHEET: C-16

SUPPLEMENTAL GENERAL CONDITIONS

BUY AMERICA CERTIFICATION

E-VERIFY

EQUAL EMPLOYMENT OPPORTUNITY

FHWA FORM 1273

LOBBYING CERTIFICATION

PATENTED/PROPRIETARY MATERIALS

PREVAILING MINIMUM WAGE (DAVIS-BACON)

PROHIBITION AGAINST CONVICT PRODUCED MATERIALS

SUSPENSION AND DEBARMENT

LAP BIG 4

LAP CERTIFICATION OF CURRENT CAPACITY

BUY AMERICA CERTIFICATE OF COMPLIANCE

CERTIFICATE OF COMPLIANCE

COMPLIANCE

The bidder hereby certifies that it will comply with the requirements of 23 C.F.R. 635.410, as amended, and utilize only iron or steel manufactured in the United States, or components made with iron or steel that meet the Buy America requirements. Bidder acknowledges that it will be required to produce Buy America certification(s) from the producer(s) of the steel or iron or components prior to incorporating any such materials into the work or project.

Company Name:_____

Authorized By:_____
(Sign) (Print Name)

Title:_____ Date:_____

LEGAL REQUIREMENTS AND RESPONSIBILITY TO THE PUBLIC – E-VERIFY. (REV 6-13-11) (FA 6-16-11) (1-15)

SECTION 7 is expanded by the following new Article:

7-28 E-Verify.

The Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Contractor during the term of the Contract and shall expressly require any subcontractors performing work or providing services pursuant to the Contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the Contract term.

U.S. Department of Transportation
Federal Highway Administration

Standard U.S. DOT Title VI ASSURANCES

DOT 1050.2 Dated 8/24/1971

Standard U.S. DOT Title VI Assurances

The (Title of Recipient) (hereinafter referred to as the "Recipient") HEREBY AGREES THAT as a condition to receiving any Federal financial assistance from the Department of Transportation it will comply with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d-42 U.S.C. 2000d-4 (hereinafter referred to as the Act), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation-Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the Regulations) and other pertinent directives, to the end that in accordance with the Act, Regulations, and other pertinent 'directives, no person in the United States shall, on the grounds of race color, or national origin, he excluded from participation in, he denied the benefits of, or he otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the Department of Transportation, including the *(Name of Appropriate Administration)*, and HEREBY GIVES ASSURANCE THAT it will promptly take any measures necessary to effectuate this agreement. This assurance is required by subsection 21.7(a)(1) of the Regulations, a copy of which is attached.

More specifically and without limiting the above general assurance, the Recipient hereby gives the following specific assurances with respect to its *(Name of Appropriate Program)*:

1. That the Recipient agrees that each "program" and each "facility as defined in subsections 21.23(e) and 21.23(b) of the Regulations, will be (with regard to a "program") conducted, or will be (with regard to a "facility") operated in compliance with all requirements imposed by, or pursuant to, the Regulations.

2. That the Recipient shall insert the following notification in all solicitations for bids for work or material subject to the Regulations and made in connection with all *(Name of Appropriate Program)* and, in adapted form in all proposals for negotiated agreements:

The (Recipient), in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, Office the Secretary, Part 21, Nondiscrimination in Federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidden that it will affirmatively insure that in any contact entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

3. That the Recipient shall insert the clauses of Appendix A of this assurance in every contract subject to the Act and the Regulations.

4. That the Recipient shall insert the clauses of Appendix B of this assurance, 'as a covenant running with the land, in any deed from the United States effecting a transfer of real property, structures, or improvements thereon, or interest therein.

5. That where the Recipient receives Federal financial assistance to construct a facility, or part of a facility, the assurance shall extend to the entire facility and facilities operated in connection therewith.

6. That where the Recipient receives Federal financial assistance in the form, or for the acquisition of real property or an interest in real property, the assurance shall extend to rights to space on, over or under such property.

7. That the Recipient shall include the appropriate clauses set forth in Appendix C of this assurance, as a covenant running with the land, in any future deeds, leases, permits, licenses, and similar agreements entered into by the Recipient with other parties: (a) for the subsequent transfer of real property acquired or improved under *(Name of Appropriate Program);* and (b) for the construction or use of or access to space on, over or under real property acquired, or improved under *(Name of Appropriate Program)*.

8. That this assurance obligates the Recipient for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property or interest therein or structures or improvements thereon, in which case the assurance obligates the Recipient or any transferee for the longer of the following periods: (a) the period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or (b) the period during which the Recipient retains ownership or possession of the property.

9. The Recipient shall provide for such methods of administration for the program as are found by the Secretary of Transportation or the official to whom he delegates specific authority to give reasonable guarantee that it, other recipients, sub-grantees, contractors, subcontractors, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the Act, the Regulations and this assurance.

10. The Recipient agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the Act, the Regulations, and this assurance.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Recipient Department of Transportation under the *(Name of Appropriate Program)* and is binding on it, other recipients, sub-grantees, contractors, subcontractors, transferees, successors in interest and other participants in the *(Name of Appropriate Program)*. The person or persons whose signatures appear below are authorized to sign this assurance on behalf of the Recipient

Dated_____

_____
(Recipient)

by_____
(Signature of Authorized Official)

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

(1) Compliance with Regulations: The contractor shall comply with the Regulation relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

(2) Nondiscrimination: The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

(3) Solicitations for Subcontractors, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

(4) Information and Reports: The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the *(Recipient)* or the *(Name of Appropriate Administration)* to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information the contractor shall so certify to the *(Recipient)*, or the *(Name of Appropriate Administration)* as appropriate, and shall set forth what efforts it has made to obtain the information.

(5) Sanctions for Noncompliance: In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the *(Recipient)* shall impose such contract sanctions as it or the *(Name of Appropriate Administration)* may determine to be appropriate, including, but not limited to:

(a) withholding of payments to the contractor under the contract until the contractor complies, and/or
(b) cancellation, termination or suspension of the contract, in whole or in part.

(6) Incorporation of Provisions: The contractor shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto.

The contractor shall take such action with respect to any subcontractor procurement as the *(Recipient)* or the *(Name of Appropriate Administration)* may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the *(Recipient)* to enter into such litigation to protect the interests of the *(Recipient)*, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

APPENDIX B

A. The following clauses shall he included in any and all deeds effecting or recording the transfer of real property, structures or improvements thereon, or interest therein from the United States.

(GRANTING CLAUSE)

NOW, THEREFORE, the Department of Transportation, as authorized by law, and upon the condition that the *(Name of Recipient)* will accept Title to the lands and maintain the project constructed thereon, in accordance with *(Name of Appropriate Legislative Authority)*, the Regulations for the Administration of *(Name of Appropriate Program)* and the policies and procedures prescribed by *(Name of Appropriate Administration)* of the Department of Transportation and, also in accordance with and in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, Office of the Secretary, Part 21, Nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter referred to as the Regulations) pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. .2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the *(Name of Recipient)* all the right, Title and interest of the Department of Transportation in and to said lands described in Exhibit "A" attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto *(Name of Recipient)* and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and shall be binding on the *(Name of Recipient)*, its successors and assigns.

The *(Name of Recipient)*, in consideration or the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person shall on the grounds of race, color, or national origin, he excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on over or under such lands hereby conveyed [,] [and)* (2) that the *(Name of Recipient)* shall use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, Office of the Secretary, Part 21, Nondiscrimination in federally assisted programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may he amended [,] and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department shall have a right to reenter said lands and facilities on said land, and the above described land and facilities shall thereon revert to and vest in and become the absolute property of the Department of Transportation and its assigns as such interest existed prior to this instruction.*

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* Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to effectuate the purposes of Title VI of the Civil Rights Act of 1964.

APPENDIX C

The following clauses shall be included in all deeds, licenses, leases, permits, or similar instruments entered into by the *(Name of Recipient)* pursuant to the provisions of Assurance 6(a).

The (grantee, licensee, lessee, permitee, etc., as appropriate) for himself, his heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that in the event facilities are constructed, maintained, or otherwise operated on the said property described in this (deed, license, lease, permit, etc.) for a purpose for which a Department of Transportation program or activity is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permitee, etc.) shall maintain and operate such facilities and services in compliance with all other requirements imposed pursuant to Title 49, Code of Federal Regulations, Department of Transportation, SubTitle A, office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations may be amended.

[Include in licenses, leases, permits, etc.]*

That in the event of breach of any of the above nondiscrimination covenants, *(Name of Recipient)* shall have the right to terminate the [license, lease, permit, etc.] and to re-enter and repossess said land and the facilities thereon, and hold the same as if said [licenses, lease, permit, etc.] had never been made or issued.

[Include in deed.]*

That in the event of breach of any of the above nondiscrimination covenants, *(Name of Recipient*) shall have the right to reenter said lands and facilities thereon, and the above described lands and facilities shall thereupon revert to and vest in and become the absolute property of *(Name of Recipient)* and its assigns.

The following shall be included in all deeds, licenses, leases, permits, or similar agreements entered into by *(Name of Recipient)* pursuant to the provisions of Assurance 6(b).

The (grantee, licensee, lessee, permitee, etc., as appropriate) for himself, his personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds, and leases add "as a covenant running with the land") that (1) no person on the ground of race, color. or national origin shall be excluded from participation in, denied the benefits of, or he otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over or under such land and the furnishing of services thereon, no person on the ground of, race, color, or national origin shall be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permitee, etc.) shall use the premises in compliance with all other requirements imposed by or pursuant to Title 49, Code of Federal Regulations. Department of Transportation, SubTitle A, Office of the Secretary. Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964), and as said Regulations may be amended.

[Include in licenses, leases, permits, etc.]*

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* Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to effectuate the purposes of Title VI of the Civil Rights Act of 1964.

That in the event of breach of any of the above nondiscrimination covenants, (Name of Recipient) shall have the right to terminate the [license, lease, permit, etc.] and to reenter and repossess said land and the facilities thereon, and hold the same as if said [license, lease, permit, etc.] had never been made or issued.

[Include in deeds]*

That in the event of breach of any of the above nondiscrimination covenants, *(Name of Recipient)* shall have the right to reenter said land and facilities there-on, and the above described lands and facilities shall thereupon revert to and vest in and become the absolute property of *(Name of Recipient)* and its assigns.

* Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to effectuate the purposes of Title VI of the Civil Rights Act of 1964.

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

CERTIFICATION REGARDING LOBBYING

The undersigned Bidder/Contractor certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form – LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying", 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)]

(3) The undersigned shall require that the language of this certification be included in the awards documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. 1352 (1)-(2)(A), any person who makes a prohibited expenditure of fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure]

The Bidder/Contractor, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, *et seq., apply* to this certification and disclosure, if any.

Company Name:_____

Authorized By:_____
(Sign) (Print Name)

Title:_____ Date:_____

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

The Bidder certifies that, the firm or any person associated therewith in the capacity of owner, partner, director, officer, principal, investigator, project director, manager, auditor, and/or position involving the administration of federal funds:

(a) are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions, as defined in 49 CFR s29.110(a), by any federal department or agency;

(b) have not within a three-year period preceding this certification been convicted of or had a civil judgment rendered against it for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state, or local government transaction or public contract; violation of federal or state antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property

(c) are not presently indicted for or otherwise criminally or civilly charged by a federal, state, or local governmental entity with commission of any of the offenses enumerated in paragraph (b) of this certification; and

(d) have not within a three-year period preceding this certification had one or more federal, state, or local government public transactions terminated for cause or default.

The Bidder certifies that it shall not knowingly enter into any transaction with any subcontractor, material supplier, or vendor who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this project by any federal agency unless authorized by the Florida Department of Transportation."

Company Name:_____

Authorized By:_____
(Sign) (Print Name)

Title:_____ Date:_____

CITY OF DELRAY BEACH

DELRAY BEACH FLORIDA ★★★★★ All-America City 1993 2001

ENVIRONMENTAL SERVICES DEPARTMENT
434 SOUTH SWINTON AVENUE • DELRAY BEACH, FLORIDA 33444
(561) 243-7336 • FAX (561) 243-7060
mydelraybeach.com

Proprietary Product Certification

To: Ellen Daniel, PE,
Local Program Engineer

Date: 8/8/2014

Financial Project ID: FM# 431650-1-58-01
Road Number and/or Name: NE 2nd Avenue between NE 8th Street and NE 4th Street
County: Palm Beach
Full Federal Oversight: No ☑ Yes ☐ Note: if Yes, submit to FHWA Director

The request is for the proprietary use of "Attachment A" products being proposed as part of the above referenced project. The proprietary product is necessary for the satisfactory operation of the existing facility. The attached supporting documentation demonstrates that the proposed materials satisfy with the requirements of 23 CFR 635.411 (a) (2):

- ☐ **Function** - the proprietary product is necessary for the satisfactory operation of the existing facility
- ☑ **Aesthetics** - proprietary product is necessary to match the visual appearance of existing facilities
- ☑ **Logistics** -- the proprietary product is interchangeable with products within the agency's existing maintenance inventory

A justification and supporting document is attached to this document.

I, Director of ESD
Position/Title

City of Delray Beach
Name of Agency

do hereby certify that in accordance with the requirements of 23 CFR 635.411 (a) (2),

- ☑ that this patented or proprietary item is essential for synchronization with existing highway facilities.
- ☐ that no equally suitable alternative exists for this patented or proprietary item.

Randall W. Kenney
Signature

AUG 08 2014
Date

For Department Use Only

"I Howard Webb, P.E., District IV Design Engineer, of the Florida Department of Transportation, do hereby approve this certification request made in accordance with the requirements of 23 CFR 635.411(a)(2),

( ) *that this patented or proprietary item is essential for synchronization with existing highway facilities.*
( ) *that no equally suitable alternative exists for this patented or proprietary item.*
Identify any conditions and limitations:

Signature *Date*

Concurrence: "I, Ellen Daniel, PE, Local Program Engineer of the Florida Department of Transportation, do hereby recommend approval of this certification request."

Signature *Date*

Attachment A

Irrigation

1 Valves: Rain Bird PESB-PRS-D

2. Bubblers: Rain Bird 1802-1400 Flood

3. Sprays: Toro O-T-570Z-12P-PRX-COM

4. Controller: "Irrinet M" controller by Motorola

5. Counter: Bermad Counter Valve

6. Rain sensor: Hunter Mini-Clik

7. Backflow: Febco 825Y Reduced Pressure Zone Assembly

Electrical/Lighting Items:

1. Poles: Ameron – Victorian Style Ver 4.6 (4131) Green with Amerishield Anti-Graffiti Coating (embedded type concrete pole)

2. Fixtures: Spring City Electrical Mfg. Co. – Cat. #ALMDLR-LE095/EVX/X2-40-CR3-FS11-FDL-HS-CU

3. Double-Head Brackets: Vertex Illuminations of America - Cat. #SS-DEL-1A-RAL6016 Green

4. Pullboxes: Quazite, Synertech, or Brooks - Polymer Concrete 11x18x12 w/two stainless bolts on bolt-down polymer concrete cover

General Decision Number: FL160225 01/08/2016 FL225

Superseded General Decision Number: FL20150225

State: Florida

Construction Type: Highway

County: Palm Beach County in Florida.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/08/2016

* SUFL2013-043 08/19/2013

	Rates	Fringes
CARPENTER, Includes Form Work....	$ 15.38	0.00
CEMENT MASON/CONCRETE FINISHER...	$ 15.69	0.00
ELECTRICIAN.....	$ 18.20	0.00
FENCE ERECTOR.....	$ 12.82	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine).....	$ 15.09	0.00
HIGHWAY/PARKING LOT STRIPING: Painter.....	$ 12.13	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Spray Nozzleman).....	$ 11.81	0.00
INSTALLER - GUARDRAIL.....	$ 13.96	0.00
IRONWORKER, ORNAMENTAL.....	$ 13.48	0.00
IRONWORKER, REINFORCING.....	$ 16.58	0.00
IRONWORKER, STRUCTURAL.....	$ 16.42	0.00
LABORER (Traffic Control		

Specialist incl. placing of cones/barricades/barrels - Setter, Mover, Sweeper)	$ 12.97	0.00
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 12.99	0.00
LABORER: Common or General	$ 10.66	0.00
LABORER: Flagger	$ 12.53	0.00
LABORER: Grade Checker	$ 12.41	0.00
LABORER: Landscape & Irrigation	$ 9.02	0.00
LABORER: Mason Tender - Cement/Concrete	$ 13.91	3.50
LABORER: Pipelayer	$ 14.82	0.00
OPERATOR: Backhoe/Excavator/Trackhoe	$ 15.66	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 12.88	0.00
OPERATOR: Boom	$ 18.95	0.00
OPERATOR: Boring Machine	$ 16.23	0.00
OPERATOR: Broom/Sweeper	$ 12.70	0.00
OPERATOR: Bulldozer	$ 16.00	0.00
OPERATOR: Concrete Finishing Machine	$ 15.44	0.00
OPERATOR: Concrete Saw	$ 16.22	0.00
OPERATOR: Crane	$ 21.66	0.00
OPERATOR: Curb Machine	$ 20.76	0.00
OPERATOR: Distributor	$ 14.76	0.00
OPERATOR: Drill	$ 14.78	0.00
OPERATOR: Forklift	$ 16.32	0.00
OPERATOR: Gradall	$ 15.75	0.91
OPERATOR: Grader/Blade	$ 20.25	0.00
OPERATOR: Grinding/Grooving Machine	$ 13.87	0.00
OPERATOR: Loader	$ 14.19	0.00

OPERATOR: Mechanic.....$ 18.03 0.00

OPERATOR: Milling Machine.....$ 15.60 0.00

OPERATOR: Oiler.....$ 16.32 0.00

OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....$ 14.73 2.36

OPERATOR: Piledriver.....$ 17.23 0.00

OPERATOR: Post Driver (Guardrail/Fences).....$ 14.45 0.00

OPERATOR: Roller.....$ 13.03 0.00

OPERATOR: Scraper.....$ 12.01 0.00

OPERATOR: Screed.....$ 15.51 0.00

OPERATOR: Tractor.....$ 10.79 0.00

OPERATOR: Trencher.....$ 14.74 0.00

PAINTER: Spray.....$ 16.52 0.00

SIGN ERECTOR.....$ 14.02 0.00

TRUCK DRIVER: Distributor Truck.....$ 14.96 2.17

TRUCK DRIVER: Dump Truck.....$ 11.84 0.00

TRUCK DRIVER: Flatbed Truck.....$ 14.28 0.00

TRUCK DRIVER: Lowboy Truck.....$ 13.98 0.00

TRUCK DRIVER: Slurry Truck.....$ 11.96 0.00

TRUCK DRIVER: Vactor Truck.....$ 14.21 0.00

TRUCK DRIVER: Water Truck.....$ 13.25 0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification

and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.

Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

SECTION 6
CONTROL OF MATERIALS

6-1 Acceptance Criteria.

6-1.1 General: Acceptance of materials is based on the following criteria. All requirements may not apply to all materials. Use only materials in the work that meet the requirements of these Specifications. The Engineer may inspect and test any material, at points of production, distribution and use.

6-1.2 Sampling and Testing: Use the Department's current sample identification and tracking system to provide related information and attach the information to each sample. Restore immediately any site from which material has been removed for sampling purposes to the pre-sampled condition with materials and construction methods used in the initial construction, at no additional cost to the Department.

Ensure when a material is delivered to the location as described in the Contract Documents, there is enough material delivered to take samples, at no expense to the Department.

6-1.2.1 Pretest by Manufacturers: Submit certified manufacturer's test results to the Engineer for qualification and use on Department projects. Testing will be as specified in the Contract Documents. The Department may require that manufacturers submit samples of materials for independent verification purposes.

6-1.2.2 Point of Production Test: Test the material during production as specified in the Contract Documents.

6-1.2.3 Point of Distribution Test: Test the material at Distribution facilities as specified in the Contract Documents.

6-1.2.4 Point of Use Test: Test the material immediately following placement as specified in the Specifications. After delivery to the project, the Department may require the retesting of materials that have been tested and accepted at the source of supply, or may require the testing of materials that are to be accepted by Producer Certification. The Department may reject all materials that, when retested, do not meet the requirements of these Specifications.

6-1.3 Certification:

6-1.3.1 Producer Certification: Provide complete certifications for materials as required. Furnish to the Engineer for approval, Producer Certifications for all products listed on the Qualified Products List and when required by the applicable material Specification(s). Do not incorporate any manufactured products or materials into the project without approval from the Engineer. Materials will not be considered for payment when not accompanied by Producer Certification. Producers may obtain sample certification forms through the Department's website. Ensure that the certification is provided on the producer's letterhead and is signed by a legally responsible person from the producer and notarized.

6-1.3.1.1 Qualified Products List: The Product Evaluation Section in the State Specifications and Estimates Office publishes and maintains a Qualified Products List. This list provides assurance to Contractors, consultants, designers, and Department personnel that specific products and materials are approved for use on Department facilities. The Department will limit the Contractor's use of products and materials that require pre-approval to items listed on the Qualified Products List effective at the time of placement.

Manufacturers seeking evaluation in accordance with Departmental procedures of an item must submit a Product Evaluation Application, available on the Department's website

www2.dot.state.fl.us/specificationsestimates/productevaluation/qpl/submittalprocess.aspx , with supporting documentation as defined and detailed by the applicable Specifications and Standards. This may include certified test reports from an independent test laboratory, certification that the material meets all applicable specifications, signed and sealed drawings and calculations, quality control plans, samples, infrared scans, or other technical data.

Manufacturers successfully completing the Department's evaluation are eligible for inclusion on the Qualified Products List. The Department will consider any marked variations from original test values for a material or any evidence of inadequate field performance of a material as sufficient evidence that the properties of the material have changed, and the Department will remove the material from the Qualified Products List.

6-1.3.1.2 Approved Products List: The State Traffic Operations Office maintains the Approved Products List of Traffic Control Signal Devices. Traffic Monitoring Site Equipment and Materials are also included on the Approved Products List. This list provides assurance to Maintaining Agencies, Contractors, consultants, designers, and Department personnel that the specific items listed are approved for use on Department facilities. The Department will limit the Contractor's procurement and use of Traffic Control Signal Devices, and Traffic Monitoring Site equipment and materials to only those items listed on the Approved Products List that is effective at the time of procurement, except as provided in Section 603.

The approval process is described in detail on the State Traffic Operation website, www.dot.state.fl.us/trafficoperations/terl/apl2.htm . Manufacturers seeking evaluation of a specific device must submit an application which can be obtained from the State Traffic Operations Office.

6-1.3.2 Contractor Installation Certification: Provide installation certifications as required by the Contract Documents.

6-2 Applicable Documented Authorities Other Than Specifications.

6-2.1 General: Details on individual materials are identified in various material specific Sections of the Specifications that may refer to other documented authorities for requirements. When specified, meet the requirements as defined in such references.

6-2.2 Test Methods: Methods of sampling and testing materials are in accordance with the Florida Methods (FM). If a Florida Method does not exist for a particular test, perform the testing in accordance with the method specified in the Specification. When test methods or other standards are referenced in the Specifications without identification of the specific time of issuance, use the most current issuance, including interims or addendums thereto, at the time of bid opening.

6-2.3 Construction Aggregates: Aggregates used on Department projects must be in accordance with Rule 14-103, FAC.

6-3 Storage of Materials and Samples.

6-3.1 Method of Storage: Store materials in such a manner as to preserve their quality and fitness for the work, to facilitate prompt inspection, and to minimize noise impacts on sensitive receivers. More detailed specifications concerning the storage of specific materials are prescribed under the applicable Specifications. The Department may reject improperly stored materials.

6-3.2 Use of Right-of-Way for Storage: If the Engineer allows, the Contractor may use a portion of the right-of-way for storage purposes and for placing the Contractor's plant and equipment. Use only the portion of the right-of-way that is outside the clear zone, which is the

portion not required for public vehicular or pedestrian travel. When used, restore the right-of-way to pre-construction condition at no additional cost to the Department or as specified in the Contract Documents. Provide any additional space required at no expense to the Department.

6-3.3 Responsibility for Stored Materials: Accept responsibility for the protection of stored materials. The Department is not liable for any loss of materials, by theft or otherwise, or for any damage to the stored materials.

6-3.4 Storage Facilities for Samples: Provide facilities for storage of samples as described in the Contract Documents and warranted by the test methods and Specifications.

6-4 Defective Materials.

Materials not meeting the requirements of these Specifications will be considered defective. The Engineer will reject all such materials, whether in place or not. Remove all rejected material immediately from the site of the work and from storage areas, at no expense to the Department.

Do not use material that has been rejected and the defects corrected, until the Engineer has approved the material's use. Upon failure to comply promptly with any order of the Engineer made under the provisions of this Article, the Engineer will remove and replace defective material and deduct the cost of removal and replacement from any moneys due or to become due the Contractor.

As an exception to the above, the Contractor may submit, upon approval of the Engineer, an engineering and/or laboratory analysis to evaluate the effect of defective in place materials. A Specialty Engineer, who is an independent consultant or the Contractor's Engineer of Record as stated within each individual Section shall perform any such analysis. The Engineer will determine the final disposition of the material after review of the information submitted by the Contractor. No additional monetary compensation or time extension will be granted for the impact of any such analysis or review.

6-5 Products and Source of Supply.

6-5.1 Source of Supply–Convict Labor (Federal-Aid Contracts Only): Do not use materials that were produced after July 1, 1991, by convict labor for Federal-aid highway construction projects unless the prison facility has been producing convict-made materials for Federal-aid highway construction projects before July 1, 1987.

Use materials that were produced prior to July 2, 1991, by convicts on Federal-aid highway construction projects free from the restrictions placed on the use of these materials by 23 U.S.C. 114. The Department will limit the use of materials produced by convict labor for use in Federal-aid highway construction projects to:

1. materials produced by convicts on parole, supervised release, or probation from a prison or,
2. materials produced in a qualified prison facility.

The amount of such materials produced for Federal-aid highway construction during any 12-month period shall not exceed the amount produced in such facility for use in such construction during the 12-month period ending July 1, 1987.

6-5.2 Source of Supply-Steel (Federal-Aid Contracts Only): For Federal-aid Contracts, only use steel and iron produced in the United States, in accordance with the Buy America provisions of 23 CFR 635.410, as amended. Ensure that all manufacturing processes for this material occur in the United States. As used in this specification, a manufacturing process is

any process that modifies the chemical content, physical shape or size, or final finish of a product, beginning with the initial melding and mixing and continuing through the bending and coating stages. A manufactured steel or iron product is complete only when all grinding, drilling, welding, finishing and coating have been completed. If a domestic product is taken outside the United States for any process, it becomes foreign source material. When using steel and iron as a component of any manufactured product incorporated into the project (e.g., concrete pipe, prestressed beams, corrugated steel pipe, etc.), these same provisions apply, except that the manufacturer may use minimal quantities of foreign steel and iron when the cost of such foreign materials does not exceed 0.1% of the total Contract amount or $2,500, whichever is greater. These requirements are applicable to all steel and iron materials incorporated into the finished work, but are not applicable to steel and iron items that the Contractor uses but does not incorporate into the finished work. Provide a certification from the producer of steel or iron, or any product containing steel or iron as a component, stating that all steel or iron furnished or incorporated into the furnished product was manufactured in the United States in accordance with the requirements of this specification and the Buy America provisions of 23 CFR 635.410, as amended. Such certification shall also include (1) a statement that the product was produced entirely within the United States, or (2) a statement that the product was produced within the United States except for minimal quantities of foreign steel and iron valued at $ (actual value). Furnish each such certification to the Engineer prior to incorporating the material into the project. When FHWA allows the use of foreign steel on a project, furnish invoices to document the cost of such material, and obtain the Engineer's written approval prior to incorporating the material into the project.

6-5.3 Unfit, Hazardous, and Dangerous Materials: Do not use any material that, after approval and/or placement, has in any way become unfit for use. Do not use materials containing any substance that has been determined to be hazardous by the State of Florida Department of Environmental Protection or the U.S. Department of Environmental Protection. Provide workplaces free from serious recognized hazards and to comply with occupational safety and health standards, as determined by the U.S. Department of Labor Occupational Safety and Heath Administration.

SUSPENSION AND DEBARMENT

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION FOR FEDERAL AID CONTRACTS

(Compliance with 49CFR, Section 29.510)
(Appendix B Certification]

It is certified that neither the below identified firm nor its principals are presently suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

Name of Consultant:

By:_____ Date:_____
Authorized Signature

Title:_____

Instructions for Certification

1. By signing and submitting this certification with the proposal, the prospective lower tier participant is providing the certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the Department may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted. if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms 'covered transaction', 'debarred', 'suspended', 'ineligible', 'lower tier covered transaction','participant', 'person', .primary covered transaction', 'principal', 'proposal', and 'voluntarily excluded', as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the person to which this proposal is being submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled 'Appendix B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction", without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enter into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the Department may pursue available remedies, including suspension and/or debarment.

LANDSCAPE INSTALLATION FOR LAP (OFF-SYSTEM).
(REV 4-5-11) (FA 4-15-11)

SECTION 580
LANDSCAPE INSTALLATION FOR LAP (OFF-SYSTEM)

580-1 Description.

Plant trees and shrubs of the species, size, and quality indicated in the plans.

The Engineer reserves the right to adjust the number and location of any of the designated types and species to be used at any of the locations shown, in order to provide for any unanticipated effects which might become apparent after the substantial completion of other phases of the project, or for other causes.

580-2 Materials.

580-2.1 Plants:

580-2.1.1 Authority for Nomenclature; Species, etc.: For the designated authority in the identification of all plant material, refer to two publications of L.H. Bailey: "Hortus III" and "Manual of Cultivated Plants," and ensure that all specimens are true to type, name, etc., as described therein. For the standard nomenclature, refer to the publication of the American Joint Committee on Horticultural Nomenclature, "Standardized Plant Names."

580-2.1.2 Grade Standards and Conformity with Type and Species: Only use nursery grown plant material except where specified as Collected Material. Use nursery grown plant material that complies with all required inspection, grading standards, and plant regulations in accordance with the latest edition of the Florida Department of Agriculture's "Grades and Standards for Nursery Plants".

Except where a lesser grade might be specifically specified in the plans, ensure that the minimum grade for all trees and shrubs is Florida No. 1. Ensure that all plants are the proper size and grade at the time of delivery to the site, throughout the project construction period and during any designated plant establishment period.

Ensure that plant materials are true to type and species and that any plant materials not specifically covered in Florida Department of Agriculture's "Grades and Standards for Nursery Plants" conform in type and species with the standards and designations in general acceptance by Florida nurseries.

Ensure that plant materials are shipped with tags stating the botanical and common name of the plant.

580-2.1.3 Inspection and Transporting: Move nursery stock in accordance with all Federal and State regulations therefor, and accompany each shipment with the required inspection certificates for filing with the Engineer.

580-2.2 Water: Water used in landscaping operations may be obtained from any approved source. Ensure that water is free of any substance which might be detrimental to plant growth. The use of effluent water is subject to approval and must meet all Federal, State and Local requirements.

580-3 Specific Requirements for the Various Plant Designations.

580-3.1 Balled-and-Burlapped Plants (B&B), and Wired Balled-and-Burlapped (WB & B):

580-3.1.1 General: Properly protect the root ball of these plants until planting them. The Engineer may reject any plant which shows evidence of having been mishandled.

Set the B&B and WB&B plants then remove the top 2/3 of all wire, rope, and binding surrounding the plant. Remove the burlap from the top 4 inches of the root ball. Do not disturb the root ball in any way. Bare root material is not allowed for substitution.

At least 90 days before digging out B & B and WB & B plants, root-prune those 1 1/2 inches or greater in diameter and certify such fact on accompanying invoices.

580-3.1.2 Provisions for Wiring: For plants grown in soil of a loose texture, which does not readily adhere to the root system (and especially in the case of large plants or trees), the Engineer may require WB & B plants. For WB & B plants, before removing the plant from the excavated hole, place sound hog wire around the burlapped ball, and loop and tension it until the tightened wire netting substantially packages the burlapped ball such as to prevent disturbing of the loose soil around the roots during handling.

580-3.2 Container-Grown Plants (CG): The Engineer will not accept any CG plants with roots which have become pot-bound or for which the top system is too large for the size of the container. Fully cut and open all containers in a manner that will not damage the root system. Do not remove CG plants from the container until immediately before planting to prevent damage to the root system.

580-3.3 Collected Plants (Trees and Shrubs) (C): Use C plants which have a root ball according to “Florida Grades and Standards for Nursery Plants”. Do not plant any C plant before the Engineer’s inspection and acceptance at the planting site.

580-3.4 Collected Plants (Herbaceous) (HC): The root mass and vegetative portions of collected herbaceous plants shall be as large as the specified container-grown equivalent. Do not plant any collected plant before inspection and acceptance by the Engineer.

580-3.5 Specimen Plants (Special Grade): When Specimen (or Special Grade) plants are required, label them as such on the plant list, and tag the plant to be furnished.

580-3.6 Palms: Wrap the roots of all plants of the palm species before transporting, except if they are CG plants and ensure that they have an adequate root ball structure and mass for healthy transplantation as defined in “Florida Grades and Standards for Nursery Plants”.

The Engineer will not require burlapping if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.

Move sabal and coconut palms in accordance with the “Florida Grades and Standards for Nursery Plants.”

580-3.7 Substitution of Container-Grown (CG) Plants: With the Engineer’s approval, the Contractor may substitute CG plants for any other root classification types, if he has met all other requirements of the Contract Documents.

580-4 Planting Requirements.

580-4.1 Layout: Prior to any excavation or planting, mark all planting beds and individual locations of palms, trees, large shrubs and proposed art and architectural structures, as shown in the plans, on the ground with a common bright orange colored spray paint, or with other approved methods, within the project limits. Obtain the Engineer's approval and make necessary utility clearance requests.

580-4.2 Excavation of Plant Holes: Excavate plant holes after an area around the plant three times the size of the root ball has been tilled to a depth of the root ball. Ensure that the plant hole is made in the center of the tilled area only to the depth of the plant root ball.

Where excess material has been excavated from the plant hole, use the excavated material to backfill to proper level.

580-4.3 Setting of Plants: Center plants in the hole. Lower the plant into the hole so that it rests on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance.

Backfill with native soil, unless otherwise specified on the plans. Firmly rod and water-in the backfill so that no air pockets remain. Apply a sufficient quantity of water immediately upon planting to thoroughly moisten all of the backfilled earth. Keep plants in a moistened condition for the duration of the planting period.

When so directed, form a water ring 6 inches in width to make a water collecting basin with an inside diameter equal to the diameter of the excavated hole. Maintain the water ring in an acceptable condition.

580-4.4 Special Bed Preparation: Where multiple or mass plantings are to be made in extended bedding areas, and the plans specify Special Bed Preparation, prepare the planting beds as follows:

Remove all vegetation from within the area of the planting bed and excavate the surface soil to a depth of 6 inches. Backfill the excavated area with peat, sand, finish soil layer material or other material to the elevation of the original surface. Till the entire area to provide a loose, friable mixture to a depth of at least 8 inches. Level the bed only slightly above the adjacent ground level. Then mulch the entire bedding area, in accordance with 580-8.

580-5 Staking and Guying.

580-5.1 General: When specified in the plans, or as directed by the Engineer, stake plants in accordance with the following.

Use wide plastic, rubber or other flexible strapping materials to support the tree to stakes or ground anchors that will give as the tree moves in any direction up to 30 degrees. Do not use rope or wire through a hose. Use guy chords, hose or any other thin bracing or anchorage material which has a minimum 12 inches length of high visibility flagging tape secured to guys, midway between the tree and stakes for safety.

Stake trees larger than 1 inch diameter and smaller than 2 inches diameter with a 2 by 2 inch stake, set at least 2 feet in the ground and extending to the crown of the plant. Firmly fasten the plant to the stake with flexible strapping materials as noted above.

580-5.2 Trees of 2 to 3 1/2 inches [50 to 90 mm] Caliper: Stake all trees, other than palm trees, larger than 2 inches caliper and smaller than 3 1/2 inches caliper with two 2 by 4 inch stakes, 8 feet long, set 2 feet in the ground. Place the tree midway between the stakes and hold it firmly in place by flexible strapping materials as noted above.

580-5.3 Large Trees: Guy all trees, other than palm trees, larger than 3 1/2 inches caliper, from at least three points, with flexible strapping materials as noted above.

Anchor flexible strapping to 2 by 4 by 24 inch stakes, driven into the ground such that the top of the stake is at least 3 inches below the finished ground.

580-5.4 Special Requirements for Palm Trees: Brace palms which are to be staked with three 2 by 4 inch wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2 by 4 by 12 inch stake pads.

580-6 Tree Protection and Root Barriers.

Install tree barricades when called for in the Contract Documents or by the Engineer to protect existing trees from damage during project construction. Place barricades at the drip line of the tree foliage or as far from the base of the tree trunk as possible. Barricades shall be able to withstand bumps by heavy equipment and trucks. Maintain barricades in good condition.

When called for in the Contract Documents, install root barriers or fabrics in accordance with the details shown.

580-7 Pruning.

Prune all broken or damaged roots and limbs in accordance with established arboriculture practices. When pruning is completed ensure that all remaining wood is alive. Do not reduce the size or quality of the plant below the minimum specified.

580-8 Mulching.

Uniformly apply mulch material, consisting of wood chips (no Cypress Mulch is allowed), pine straw, compost, or other suitable material approved by the Engineer, to a minimum loose thickness of 3 inches over the entire area of the backfilled hole or bed within two days after the planting. Maintain the mulch continuously in place until the time of final inspection.

580-9 Disposal of Surplus Materials and Debris.

Dispose of surplus excavated material from plant holes by scattering or otherwise as might be directed so that it is not readily visible or conspicuous to the passing motorist or pedestrian. Remove all debris and other objectionable material from the site and clean up the entire area and leave it in neat condition.

580-10 Contractor's Responsibility for Condition of the Plantings.

Ensure that the plants are kept watered, that the staking and guying is kept adjusted as necessary, that all planting areas and beds are kept free of weeds and undesirable plant growth and that the plants are maintained so that they are healthy, vigorous, and undamaged at the time of acceptance.

580-11 Plant Establishment Period.

If the Contract Documents designate a Plant Establishment Period, assume responsibility for the proper maintenance, survival and condition of all landscape items during such period at no additional cost.

580-12 Method of Measurement.

The quantities to be paid for will be the items shown in the plans, completed and accepted.

580-13 Basis of Payment.

Prices and payments will be full compensation for all work specified in this Section.

EARTHWORK AND RELATED OPERATIONS FOR LAP (OFF-SYSTEM).
(REV 1-23-12) (FA 2-27-12)

SECTION 120
EARTHWORK AND RELATED OPERATIONS FOR LAP (OFF-SYSTEM)

120-1 Description.

120-1.1 General: Perform earthwork and related operations based on the type of work specified in the Contract and the Earthwork Categories as defined below. Meet the applicable requirements for materials, equipment and construction as specified.

Earthwork and related operations consists of excavation for the construction of the roadway, excavation for structures and pipe, constructing backfill around structures and pipe, and constructing embankments as required for the roadway, ditches, and channel changes.

120-1.2 Earthwork Categories: Performance of Earthwork Operations will fall into one of the following Earthwork Categories:

120-1.2.1 Earthwork Category 1: Includes the earthwork and related operations associated with the construction of sidewalks and bike paths along with any drainage structures associated with these facilities.

120-1.2.2 Earthwork Category 2: Includes the earthwork and related operations associated with the construction of turn lanes and other non-mainline traffic lanes, widening, roadway shoulders, concrete box culverts, retaining walls, and other drainage structures on the non-mainline pavement.

120-1.2.3 Earthwork Category 3: Includes the earthwork and related operations associated with the construction of new mainline pavement, along with concrete box culverts, retaining walls, and other drainage structures on the mainline pavement.

120-2 Classes of Excavation.

120-2.1 Excavation of Unsuitable Material: Excavation of unsuitable material consists of the removal of muck, clay, rock or any other material that is unsuitable in its original position and that is excavated below the finished grading template. For stabilized bases and sand bituminous road mixes, the finished grading template is the top of the finished base, shoulders and slopes. For all other bases and rigid pavement, the finished grading template is the finished shoulder and slope lines and bottom of completed base or rigid pavement.

120-2.2 Lateral Ditch Excavation: Lateral ditch excavation consists of all excavation of inlet and outlet ditches to structures and roadway, changes in channels of streams, and ditches parallel to the roadway right-of-way. Dress lateral ditches to the grade and cross-section shown in the plans.

120-2.3 Channel Excavation: Channel excavation consists of the excavation and satisfactory disposal of all materials from the limits of the channel as shown in the plans.

120-2.4 Excavation for Structures and Pipe: Excavation for structures consists of the excavation for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

120-3 Excavation Requirements.

120-3.1 Excavation and Replacement of Unsuitable Materials: Where rock, muck, clay, or other material within the limits of the roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the plans or indicated by the Engineer, and backfill with suitable material. Shape backfill materials to the required cross-sections. Where the removal of plastic soils below the finished earthwork grade is required, meet a construction tolerance of plus or minus 0.2 foot in depth and plus or minus 6 inches (each side) in width.

120-3.2 Lateral Ditch Excavation: Excavate inlet and outlet ditches to structures and roadway, changes in channels of streams and ditches parallel to the roadway. Dress lateral ditches to the grade and cross-section shown in the plans.

120-3.3 Channel Excavation: Excavate and dispose of all materials from the limits of the channel as shown in the plans. Excavate for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

120-3.4 Excavation for Structures and Pipe.

120-3.4.1 Requirements for all Excavation: Excavate foundation pits to permit the placing of the full widths and lengths of footings shown in the plans, with full horizontal beds. Do not round or undercut corners or edges of footings. Perform all excavation to foundation materials, satisfactory to the Engineer, regardless of the elevation shown on the plans. Perform all excavation in stream beds to a depth at least 4 feet below the permanent bed of the stream, unless a firm footing can be established on solid rock before such depth is reached, and excavate to such additional depth as may be necessary to eliminate any danger of undermining. Wherever rock bottom is secured, excavate in such manner as to allow the solid rock to be exposed and prepared in horizontal beds for receiving the masonry. Remove all loose and disintegrated rock or thin strata. Have the Engineer inspect and approve all foundation excavations prior to placing masonry.

120-3.4.2 Earth Excavation:

120-3.4.2.1 Foundation Material other than the Rock: When masonry is to rest on an excavated surface other than rock, take special care to avoid disturbing the bottom of the excavation, and do not remove the final foundation material to grade until just before placing the masonry. In case the foundation material is soft or mucky, the Engineer may require excavation to a greater depth and to backfill to grade with approved material.

120-3.4.2.2 Foundation Piles: Where foundation piles are used, complete the excavation of each pit before driving the piles. After the driving is completed, remove all loose and displaced material, leaving a smooth, solid, and level bed to receive the masonry.

120-3.4.2.3 Removal of Obstructions: Remove boulders, logs, or any unforeseen obstacles encountered in excavating.

120-3.4.3 Rock Excavation: Clean all rock and other hard foundation material, remove all loose material, and cut all rock to a firm surface. Either level, step vertically and horizontally, or serrate the rock, as may be directed by the Engineer. Clean out all seams, and fill them with concrete or mortar.

120-3.4.4 Pipe Trench Excavation: Excavate trenches for pipe culverts and storm sewers to the elevation of the bottom of the pipe and to a width sufficient to provide adequate working room. Remove soil not meeting the classification specified as suitable backfill material in 120-8.3.2.2 to a depth of 4 inches below the bottom of the pipe elevation. Remove rock, boulders or other hard lumpy or unyielding material to a depth of 12 inches below the

bottom of the pipe elevation. Remove muck or other soft material to a depth necessary to establish a firm foundation. Where the soils permit, ensure that the trench sides are vertical up to at least the mid-point of the pipe.

For pipe lines placed above the natural ground line, place and compact the embankment, prior to excavation of the trench, to an elevation at least 2 feet above the top of the pipe and to a width equal to four pipe diameters, and then excavate the trench to the required grade.

120-4 Disposal of Surplus and Unsuitable Material.

120-4.1 Ownership of Excavated Materials: Dispose of surplus and excavated materials as shown in the plans or, if the plans do not indicate the method of disposal, take ownership of the materials and dispose of them outside the right-of-way.

120-4.2 Disposal of Muck on Side Slopes: As an exception to the provisions of 120-4.1, when approved by the Engineer, muck (A-8 material) may be placed on the slopes, or stored alongside the roadway, provided there is a clear distance of at least 6 feet between the roadway grading limits and the muck, and the muck is dressed to present a neat appearance. In addition, this material may also be disposed of by placing it on the slopes where, in the opinion of the Engineer, this will result in an aesthetically pleasing appearance and will have no detrimental effect on the adjacent developments. Where the Engineer permits the disposal of muck or other unsuitable material inside the right-of-way limits, do not place such material in a manner which will impede the inflow or outfall of any channel or of side ditches. The Engineer will determine the limits adjacent to channels within which such materials may be disposed.

120-4.3 Disposal of Paving Materials: Unless otherwise noted, take ownership of paving materials, such as paving brick, asphalt block, concrete slab, sidewalk, curb and gutter, etc., excavated in the removal of existing pavements, and dispose of them outside the right-of-way. If the materials are to remain the property of the Agency, place them in neat piles as directed. Existing limerock base that is removed may be incorporated in the stabilized portion of the subgrade. If the construction sequence will allow, incorporate all existing limerock base into the project as allowed by the Contract Documents.

120-4.4 Disposal Areas: Where the Contract Documents require disposal of excavated materials outside the right-of-way, and the disposal area is not indicated in the Contract Documents, furnish the disposal area without additional compensation.

Provide areas for disposal of removed paving materials out of sight of the project and at least 300 feet from the nearest roadway right-of-way line of any road. If the materials are buried, disregard the 300 foot limitation.

120-5 Materials for Embankment.

120-5.1 General Requirements for Embankment Materials: Construct embankments using suitable materials excavated from the roadway or delivered to the jobsite from authorized borrow pits.

Construct the embankment using maximum particle sizes as follows:

In top 12 inches: 3 1/2 inches (in any dimension).

12 to 24 inches: 6 inches (in any dimension).

In the depth below 24 inches: not to exceed 12 inches (in any dimension) or the compacted thickness of the layer being placed, whichever is less.

Spread all material so that the larger particles are separated from each other to minimize voids between them during compaction. Compact around these rocks in accordance with 120-7.2.

When and where approved by the Engineer, larger rocks (not to exceed 18 inches in any dimension) may be placed outside the one to two slope and at least 4 feet or more below the bottom of the base. Compact around these rocks to a firmness equal to that of the supporting soil. Where constructing embankments adjacent to bridge end bents or abutments, do not place rock larger than 3 1/2 inches in diameter within 3 feet of the location of any end-bent piling.

120-5.2 Use of Materials Excavated From the Roadway and Appurtenances: Assume responsibility for determining the suitability of excavated material for use on the project in accordance with the applicable Contract Documents. Consider the sequence of work and maintenance of traffic phasing in the determination of the availability of this material.

120-5.3 Authorization for Use of Borrow: Use borrow only when sufficient quantities of suitable material are not available from roadway and drainage excavation, to properly construct the embankment, subgrade, and shoulders, and to complete the backfilling of structures and pipe. Do not use borrow material until so ordered by the Engineer, and then only use material from approved borrow pits.

120-5.3.1 Haul Routes for Borrow Pits: Provide and maintain, at no expense to the Agency, all necessary roads for hauling the borrow material. Where borrow area haul roads or trails are used by others, do not cause such roads or trails to deteriorate in condition.

Arrange for the use of all non-public haul routes crossing the property of any railroad. Incur any expense for the use of such haul routes. Establish haul routes which will direct construction vehicles away from developed areas when feasible, and keep noise from hauling operations to a minimum. Advise the Engineer in writing of all proposed haul routes.

120-5.3.2 Borrow Material for Shoulder Build-up: When so indicated in the plans, furnish borrow material with a specific minimum bearing value, for building up of existing shoulders. Blend materials as necessary to achieve this specified minimum bearing value prior to placing the materials on the shoulders. Take samples of this borrow material at the pit or blended stockpile.

120-5.4 Materials Used at Pipes, Culverts, etc.: Construct embankments over and around pipes, culverts, and bridge foundations with selected materials.

120-6 Embankment Construction.

120-6.1 General: Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment.

120-6.2 Dry Fill Method:

120-6.2.1 General: Construct embankments to meet compaction requirements in 120-7 and in accordance with the acceptance program requirements in 120-9. Restrict the compacted thickness of the last embankment lift to 6 inches maximum.

As far as practicable, distribute traffic over the work during the construction of embankments so as to cover the maximum area of the surface of each layer.

Construct embankment in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

120-6.2.1.1 For A-3 and A-2-4 Materials with up to 15% fines: Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 12 inches. Ensure the percentage of fines passing the No. 200 US Standard sieve in the A-2-4 material does not exceed 15%.

120-6.2.1.2 For A-1 Plastic materials (As designated in FDOT Design Standard Index 505) and A-2-4 Materials with greater than 15% fines: Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 6 inches.

120-6.2.1.3 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, sumps and siphons.

When normal dewatering does not adequately remove the water, the Engineer may require the embankment material to be placed in the water or in low swampy ground in accordance with 120-7.2.4.

120-6.2.2 Placing in Unstable Areas: Where depositing the material in water, or in low swampy ground that will not support the weight of hauling equipment, construct the embankment by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. Once sufficient material has been placed so that the hauling equipment can be supported, construct the remaining portion of the embankment in layers in accordance with the applicable provisions of 120-7.2.4 and 120-7.2.6.

120-6.2.3 Placing on Steep Slopes: When constructing an embankment on a hillside sloping more than 20 degrees from the horizontal, before starting the fill, deeply plow or cut into steps the surface of the original ground on which the embankment is to be placed.

120-6.2.4 Placing Outside Standard Minimum Slope: Where material that is unsuitable for normal embankment construction is to be used in the embankment outside the standard minimum slope (approximately one to two), place such material in layers of not more than 18 inches in thickness, measured loose. The Contractor may also place material which is suitable for normal embankment, outside such standard minimum slope, in 18 inch layers. Maintain a constant thickness for suitable material placed within and outside the standard minimum slope, unless placing in a separate operation.

120-6.3 Hydraulic Method:

120-6.3.1 Method of Placing: When the hydraulic method is used, as far as practicable, place all dredged material in its final position in the embankment by such method. Place and compact any dredged material that is re-handled, or moved and placed in its final position by any other method, as specified in 120-7.2. The Contractor may use baffles or any form of construction he may select, provided the slopes of the embankments are not steeper than indicated in the plans. Remove all timber used for temporary bulkheads or baffles from the embankment, and fill and thoroughly compact the holes thus formed. When placing fill on submerged land, construct dikes prior to beginning of dredging, and maintain the dikes throughout the dredging operation.

120-6.3.2 Excess Material: Do not use excess material placed outside the prescribed slopes, below the normal high-water level, to raise the fill. Remove only the portion of this material required for dressing the slopes.

120-6.3.3 Protection of Openings in Embankment: Leave openings in the embankments at the bridge sites. Remove any material which invades these openings or existing channels without additional compensation to provide the same depth of channel as existed before the construction of the embankment. Do not excavate or dredge any material within 200 feet of the toe of the proposed embankment.

120-7 Compaction Requirements.

120-7.1 Moisture Content: Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

120-7.2 Compaction of Embankments:

120-7.2.1 Earthwork Category 1 and 2 Density Requirements: The Engineer will accept a minimum density of 95% of the maximum density as determined by AASHTO T-99 Method C for all earthwork items requiring densities.

120-7.2.2 Earthwork Category 3 Density Requirements: The Engineer will accept a minimum of 100% of the maximum density as determined by AASHTO T-99 Method C for all densities required under category 3.

Except for embankments constructed by the hydraulic method as specified in 120-6.3, and for the material placed outside the standard minimum slope as specified in 120-6.2.4, and for other areas specifically excluded herein, compact each layer of the material used in the formation of embankments to the required density stated above. Uniformly compact each layer using equipment that will achieve the required density, and as compaction operations progress, shape and manipulate each layer as necessary to ensure uniform density throughout the embankment.

120-7.2.3 Compaction Over Unstable Foundations: Where the embankment material is deposited in water or on low swampy ground, and in a layer thicker than 12 inches (as provided in 120-6.2.2), compact the top 6 inches (compacted thickness) of such layer to the density as specified in 120-9.5.

120-7.2.4 Compaction Where Plastic Material Has Been Removed: Where unsuitable material is removed and the remaining surface is of the A-4, A-5, A-6, or A-7 Soil Groups, as determined by the Engineer, compact the surface of the excavated area by rolling with a sheepsfoot roller exerting a compression of at least 250 psi on the tamper feet, for the full width of the roadbed (subgrade and shoulders). Perform rolling before beginning any backfill, and continue until the roller feet do not penetrate the surface more than 1 inch. Do not perform such rolling where the remaining surface is below the normal water table and covered with water. Vary the procedure and equipment required for this operation at the discretion of the Engineer.

120-7.2.5 Compaction of Material To Be Used In Base, Pavement, or Stabilized Areas: Do not compact embankment material which will be incorporated into a pavement, base course, or stabilized subgrade, to be constructed as a part of the same Contract.

120-7.2.6 Compaction of Grassed Shoulder Areas: For the upper 6 inch layer of all shoulders which are to be grassed, since no specific density is required, compact only to the extent directed.

120-7.2.7 Compaction of Grassed Embankment Areas: For the outer layer of all embankments where plant growth will be established, do not compact. Leave this layer in a loose condition to a minimum depth of 6 inches for the subsequent seeding or planting operations.

120-7.3 Compaction of Subgrade: If the plans do not provide for stabilizing, compact the subgrade in both cuts and fills to the density specified in 120-9.5. For undisturbed soils, do not apply density requirements where constructing narrow widening strips or paved shoulders 5 feet or less in width.

Where trenches for widening strips are not of sufficient width to permit the use of standard compaction equipment, perform compaction using vibratory rollers, trench rollers, or other type compaction equipment approved by the Engineer.

Maintain the required density until the base or pavement is placed on the subgrade.

120-8 Backfilling Around Structures and Pipe.

120-8.1 Requirements for all Structures:

120-8-1.1 General: Backfill around structures and pipe in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

129-8.1.2 Equipment and Methods: Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps, wellpoints and header pipe and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, perforated pipe drains, sumps and siphons.

120-8.1.3 Backfill Materials: Backfill to the original ground surface or subgrade surface of openings made for structures, with a sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure.

Do not allow heavy construction equipment to cross over culvert or storm sewer pipes until placing and compacting backfill material to the finished earthwork grade or to an elevation at least 4 feet above the crown of the pipe.

120-8.1.4 Use of A-7 Material: In the backfilling of trenches, A-7 material may be used from a point 12 inches above the top of the pipe up to the elevation shown on the FDOT Design Standards as the elevation for undercutting of A-7 material.

120-8.1.5 Time of Placing Backfill: Do not place backfill against any masonry or concrete abutment, wingwall, or culvert until the Engineer has given permission to do so, and in no case until the masonry or concrete has been in place seven days or until the specified 28-day compressive strength occurs.

120-8.1.6 Placement and Compaction: When the backfill material is deposited in water, compact per 120-8.2.5 and 120-8.3.4. Place the material in horizontal layers not exceeding 6 inches compacted thickness, in depth above water level, behind abutments, wingwalls and end bents or end rest piers, and around box culverts and all structures including pipe culverts. The Engineer may approve placing material in thicker lifts of no more than 12 inches compacted thickness above the soil envelope if a test section demonstrates the required density can be achieved. Approval will be based on five passing density tests over the test section consisting of a lift of backfill from structure to structure. The Engineer will identify the test section with the compaction effort and soil classification in the Agency Logbook. In case of a change in compaction effort or soil classification, construct a new test section. The Engineer reserves the right to terminate the Contractor's use of thick lift construction and have him revert to the 6 inch compacted lifts whenever it is determined that satisfactory results are not being obtained.

120-8.2 Additional Requirements for Structures Other than Pipe:

120-8.2.1 Density: Where the backfill material is deposited in water, obtain a 12 inch layer of comparatively dry material, thoroughly compacted by tamping, before the Engineer verifies layer and density requirements. Meet the requirements of the density Acceptance Criteria.

120-8.2.2 Box Culverts: For box culverts over which pavement is to be constructed, compact around the structure to an elevation not less than 12 inches above the top of the structure, using rapid-striking mechanical tampers.

120-8.2.3 Other Limited Areas: Compact in other limited areas using mechanical tampers or approved hand tampers, until the cover over the structure is at least 12 inches thick. When hand tampers are used, deposit the materials in layers not more than 4 inches thick using hand tampers suitable for this purpose with a face area of not more than 100 in^2. Take special precautions to prevent any wedging action against the masonry, and step or terrace the slope bounding the excavation for abutments and wingwalls if required by the Engineer.

120-8.2.4 Culverts and Piers: Backfill around culverts and piers on both sides simultaneously to approximately the same elevation.

120-8.2.5 Compaction Under Wet Conditions: Where wet conditions do not permit the use of mechanical tampers, compact using hand tampers. Use only A-3 material for the hand tamped portions of the backfill. When the backfill has reached an elevation and condition such as to make the use of the mechanical tampers practical, perform mechanical tamping in such manner and to such extent as to transfer the compaction force into the sections previously tamped by hand.

120-8.3 Additional Requirements for Pipe 15 Inches Inside Diameter or Greater:

120-8.3.1 General: Trenches for pipe may have up to four zones that must be backfilled.

Lowest Zone: The lowest zone is backfilled for deep undercuts up to within 4 inches of the bottom of the pipe.

Bedding Zone: The zone above the Lowest Zone is the Bedding Zone. Usually it will be the backfill which is the 4 inches of soil below the bottom of the pipe. When rock or other hard material has been removed to place the pipe, the Bedding Zone will be the 12 inches of soil below the bottom of the pipe.

Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12 inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe.

Top Zone: The Top Zone extends from 12 inches above the top of the pipe to the base or final grade.

120-8.3.2 Material:

120-8.3.2.1 Lowest Zone: Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available.

120-8.3.2.2 Soil Envelope: In both the Bedding Zone and the Cover Zone of the pipe, backfill with materials classified as A-1, A-2, or A-3. Material classified as A-4 may be used if the pipe is concrete pipe.

120-8.3.2.3 Top Zone: Backfill the area of the trench above the soil envelope of the pipe with materials allowed on Design Standard, Index No. 505.

120-8.3.3 Compaction:

120-8.3.3.1 Lowest Zone: Compact the soil in the Lowest Zone to approximately match the density of the soil in which the trench was cut.

120-8.3.3.2 Bedding Zone: If the trench was not undercut below the bottom of the pipe, loosen the soil in the bottom of the trench immediately below the approximate middle third of the outside diameter of the pipe.

If the trench was undercut, place the bedding material and leave it in a loose condition below the middle third of the outside diameter of the pipe. Compact the outer portions to meet the density requirements of the Acceptance Criteria. Place the material in lifts no greater than 6 inches (compacted thickness).

120-8.3.3.3 Cover Zone: Place the material in 6 inches layers (compacted thickness), evenly deposited on both sides of the pipe, and compact with mechanical tampers suitable for this purpose. Hand tamp material below the pipe haunch that cannot be reached by mechanical tampers. Meet the requirements of the density Acceptance Criteria.

120-8.3.3.4 Top Zone: Place the material in layers not to exceed 12 inches in compacted thickness. Meet the requirements of the density Acceptance Criteria.

120-8.3.4 Backfill Under Wet Conditions: Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing.

Granular material may be used below the elevation at which mechanical tampers would be effective, but only material classified as A-3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that it's moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand.

120-9 Acceptance Program.

120-9.1 Density over 105%: When a computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, the Engineer will perform a second density test within 5 feet. If the second density results in a value greater than 105%, investigate the compaction methods, examine the applicable Maximum Density and material description. If necessary, the Engineer will test an additional sample for acceptance in accordance with AASHTO T 99, Method C.

120-9.2 Maximum Density Determination: The Engineer will determine the maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-9.3.

120-9.3 Density Testing Requirements: Compliance with the requirements of 120-9.5 will be determined in accordance FM 1-T 238. The in-place moisture content will be determined for each density in accordance with FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven).

120-9.4 Soil Classification: The Engineer will perform soil classification tests in accordance with AASHTO T-88, and classify soils in accordance with AASHTO M-145 (Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes) in order to determine compliance with embankment utilization requirements.

120-9.5 Acceptance Criteria: The Engineer will accept a minimum density in accordance with 120-7.2 with the following exceptions:

1) embankment constructed by the hydraulic method as specified in 120-6.3;
2) material placed outside the standard minimum slope as specified in 120-6.2.4;
3) other areas specifically excluded herein.

120-9.6 Frequency: The Engineer will conduct sampling and testing at a minimum frequency listed in the table below.

Test Name	Frequency
Maximum Density	One per soil type
Density	1 per 500' RDWY (Alt Lift)
Soil Classification	One per Maximum Density

120-10 Maintenance and Protection of Work.

While construction is in progress, maintain adequate drainage for the roadbed at all times. Maintain a shoulder at least 3 feet wide adjacent to all pavement or base construction in order to provide support for the edges.

Maintain and protect all earthwork construction throughout the life of the Contract, and take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. Repair any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work. Maintain all channels excavated as a part of the Contract work against natural shoaling or other encroachments to the lines, grades, and cross-sections shown in the plans, until final acceptance of the project.

120-11 Construction.

120-11.1 Construction Tolerances: Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.3 foot above or below the plan cross-section with the following exceptions:

1. Shape the surface of shoulders to within 0.1 foot of the plan cross-section.
2. Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
3. Shape the bottom of ditches so that the ditch impounds no water.
4. When the work does not include construction of base or pavement, shape the entire roadbed (shoulder point to shoulder point) to within 0.1 foot above or below the plan cross-section.

Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the plans.

120-11.2 Operations Adjacent to Pavement: Carefully dress areas adjacent to pavement areas to avoid damage to such pavement. Complete grassing of shoulder areas prior to placing the final wearing course. Do not manipulate any embankment material on a pavement surface.

When shoulder dressing is underway adjacent to a pavement lane being used to maintain traffic, exercise extreme care to avoid interference with the safe movement of traffic.

120-12 Method of Measurement.

120-12.1 Excavation: Excavation will be paid for by volume, in cubic yards, calculated by the method of average end areas, unless the Engineer determines that another method of calculation will provide a more accurate result. The material will be measured in its original

position by field survey or by photogrammetric means as designated by the Engineer. Measurement for payment will include the excavation of unsuitable material, lateral ditch excavation, channel excavation, and excavation for structures and pipe. Payment will not be made for excavation or embankment beyond the limits shown in the plans or authorized by the Engineer.

120-12.2 Embankment: Measurement will be made on a loose volume basis, as measured in trucks or other hauling equipment at the point of dumping on the road. Payment will not be made for embankment beyond the limits shown in the plans or authorized by the Engineer.

120-13 Basis of Payment.

120-13.1 General: Prices and payments for the work items included in this Section will be full compensation for all work described herein, including excavating, dredging, hauling, placing, and compacting; dressing the surface of the earthwork; and maintaining and protecting the complete earthwork.

120-13.2 Excavation: The total quantity of all excavation specified under this Section will be paid for at the Contract unit price for Excavation. No payment will be made for the excavation of any materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials excavated outside the lines and grades given by the Engineer, unless specifically authorized by the Engineer.

120-13.3 Embankment: The total quantity of embankment specified in this Section will be paid for at the Contract unit price for embankment. No payment will be made for materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials placed outside the lines and grades given by the Engineer.

CONCRETE FOR LAP (OFF-SYSTEM).
(REV 12-20-11) (FA 2-27-12)

SECTION 344
CONCRETE FOR LAP (OFF-SYSTEM)

344-1 Description.

344-1 General: Construct concrete based on the type of work as described in the Contract and the concrete work categories as defined below.

344-1.2 Work Categories: Construction will fall into one of the following concrete work categories:

344-1.2.1 Concrete Work Category 1: Includes the construction of sidewalks, curb and gutter, ditch and slope pavement, or other non-reinforced cast-in- place elements.

344-1.2.2 Concrete Work Category 2: Includes the construction of precast concrete including concrete barriers, traffic railing barriers, parapets, sound barriers, inlets, manholes, junction boxes, pipe culverts, storm sewers, box culverts, prestressed concrete poles, concrete bases for light poles, highway sign foundations, retaining wall systems, traffic separators or other structural precast elements.

344-1.2.3 Concrete Work Category 3: Includes the work associated with the placement and/or construction of structural cast-in-place concrete meeting the requirements of this section.

344-2 Materials.

344-2.1 General: Use concrete composed of a mixture of Portland cement, aggregates, and water, with or without chemical or mineral admixtures that meet the following requirements:

344-2.1.1 Portland Cement: Portland cements meeting the requirements of AASHTO M-85 or ASTM C-150 is required. Different brands of cement, cement of the same brand from different facilities or different types of cement shall be stored separately and shall not be mixed.

344-2.1.2 Coarse and Fine Aggregates: Aggregates shall meet ASTM C 33. Source approval by the FDOT is not required.

344-2.1.3 Water: Water shall meet the requirements of ASTM C 1602.

344-2.1.4 Chemical Admixtures: Chemical admixtures shall be listed on the FDOT Qualified Products List. Admixtures may be added at the dosage rates recommended by the manufacturer.

344-2.1.5 Pozzolans and Slag: Pozzolans and Slag shall meet the requirements of Table 344-1. Fly ash shall not include the residue resulting from the burning of municipal garbage or any other refuse with coal, or the burning of industrial or municipal garbage in incinerators.

Table 344-1		
Type or Class	Test Method	Exceptions
Class C Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.
Class F Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.
Petroleum Coke Class F	ASTM C 618	Not to be used with Types IP or IS cements.

Bark Ash Class F	ASTM C 618	Not to be used with Types IP or IS cements.
Silica Fume	ASTM C 1240	
Metakaolin	ASTM C 618	
Slag	ASTM C 989	Use only ground granulated blast-furnace slag grade 100 or 120.
Ultra Fine Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.

344-3 Production, Mixing and Delivery of Concrete.

344-3.1 Concrete Production Requirements:

344-3.1.1 Category 1: Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT list of non-structural concrete producers. Concrete production facilities listed on the FDOT Producers with Accepted QC Programs list for structural concrete may also be used for Category 1.

344-3.1.2 Category 2: Use a prestressed and or precast facility listed on the FDOT Producers with Accepted QC Programs for precast or prestressed concrete.

344-3.1.3 Category 3: Use a structural concrete facility listed on the FDOT Producers with Accepted QC Programs for structural concrete.

344-3.2 Classes of Concrete: Meet the requirements of Table 344-2.

Table 344-2						
Class	Minimum Strength (28 day) (psi)	Target Slump (inches)	Target Range (inches)	Air Content Range (%)	Minimum Total Cementitious Materials Content (lb/yd^3)	Maximum Water to Cementitious Material Ratio (lb/lb)
Category 1						
Class NS	2,500	N/A	N/A	N/A	N/A	N/A
Category 3						
I	3,000	3	± 1.5	1.0 to 6.0	470	0.53
I (Pavement)	3,000	2	± 1.5	1.0 to 6.0	470	0.50
II	3,400	3	± 1.5	1.0 to 6.0	470	0.53
II (Bridge Deck)	4,500	3	± 1.5	1.0 to 6.0	611	0.44
III	5,000	3	± 1.5	1.0 to 6.0	611	0.44
III (Seal)	3,000	8	± 1.5	1.0 to 6.0	611	0.53
IV	5,500	3	± 1.5	1.0 to 6.0	658	0.41
IV (Drilled Shaft)	4,000	8.5	± 1.5	0.0 to 6.0	658	0.41
V (Special)	6,000	3	± 1.5	1.0 to 6.0	752	0.37
V	6,500	3	± 1.5	1.0 to 6.0	752	0.37
VI	8,500	3	± 1.5	1.0 to 6.0	752	0.37

344-3.3 Contractors Quality Control: For Categories 1 and 2, assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times.

For Category 3, furnish a Quality Control (QC) plan to identify to the Engineer how quality will be ensured at the project site. During random inspections, the Engineer will use this document to verify that the construction of the project is in agreement with the QC plan.

344-3.4 Concrete Mix Design: Before producing any Category 1 or Category 2, submit the proposed mix designs to the Engineer on a form provided by the Engineer. For Category 3, submit to the Engineer for approval, FDOT approved mix designs. Do not use concrete mix designs without prior approval of the Engineer.

Materials may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required original approved design mix data and batch adjustments on an Engineer approved concrete delivery ticket.

344-3.5 Delivery: For Category 3, the maximum allowable transit time of concrete is 90 minutes.

Furnish a delivery ticket on a form approved by the Engineer with each batch of concrete before unloading at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batcher responsible for producing the concrete signs the delivery ticket certifying that the batch was produced and delivered in accordance with these requirements. Sign the delivery ticket certifying that the concrete was placed in accordance with these requirements.

344-3.6 Placing Concrete:

344-3.6.1 Concreting in Cold Weather: Do not mix or place concrete when the air temperature at placement is below 45°F.

During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the air temperature within the enclosure can be kept above 50°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

344-3.6.2 Concreting in Hot Weather: For Category 3, hot weather concreting is defined as the production, placing and curing of concrete when the concrete temperature at placing exceeds 86ºF but is less than 100ºF.

Unless the specified hot weather concreting measures are in effect, reject concrete exceeding 86ºF at the time of placement. Regardless of special measures taken, reject concrete exceeding 100ºF. Predict the concrete temperatures at placement time and implement hot weather measures to avoid production shutdown.

344-3.7 Mixers: For Category 3 concrete, do not place concrete from a truck mixer that does not have a current FDOT mixer identification card.

344-3.8 Small Quantities of Concrete: With approval of the Engineer, small quantities of concrete, less than 3 cubic yards placed in one day and less than 0.5 cubic yards placed in a single placement may be accepted using a pre-bagged mixture. The Engineer may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's recommendations and will meet the requirements of this Specification.

344-3.9 Sampling and Testing:

344-3.9.1 Category 1: The Engineer may sample and test the concrete to verify its quality. The minimum 28 day compressive strength requirement for this concrete is 2,500 psi.

344-3.9.2: Category 2: No sampling and testing is required for category 2.

344-3.9.3 Category 3: The Engineer will randomly select a sample from each 200 cubic yards or one day's production to determine plastic properties and to make three 4 x 8 inch cylinders for testing by the Engineer at 28 days to ensure that the design compressive strength has been met for the class of concrete as specified in Table 344-2.

344-3.10 Records: Ensure the following records are available for review for at least 3 years after final acceptance of the project:

1. Approved concrete mix designs.
2. Materials source (delivery tickets, certifications, certified mill test reports).
3. A copy of the scale company or testing agency report showing the observed deviations from quantities checked during calibration of the scales and meters.
4. A copy of the documentation certifying the admixture weighing/measuring devices.

344-4 Acceptance of the Work.

344-4.1 Category 1 Work: Category 1 work will be accepted based on certification by the batcher and contractor on the delivery ticket.

344-4.2 Category 2 Work: Certify that the precast elements were produced by a production facility on the FDOT's list of Producers with Accepted QC Programs for precast or prestressed concrete. In addition, the producer's logo shall be stamped on the element. The producer shall not use the Florida Department of Transportation QC stamp on elements used on this project. Provide a statement of certification from the manufacturer of the precast element that the element meets the requirements of this Specification.

344-4.3 Category 3 Work: Category 3 concrete will be accepted based on the Engineer's test results for plastic properties and compressive strength requirements for the class of concrete as defined in Table 344-2. In addition, a Delivery Ticket as described in 344-3.5 will be required for acceptance of the material at the project site.

344-4.4 Small Quantities of Concrete: Category 3 concrete meeting the definition of 344-3.8 will be accepted in accordance with 344-4.3 based on test results for plastic properties and compressive strength.

344-5 Method of Measurement.

The quantities to be paid for will be the items shown in the plans, completed and accepted.

344-6 Basis of Payment.

Prices and payments will be full compensation for all work and materials specified in this Section.

SUPERPAVE ASPHALT FOR LAP (OFF-SYSTEM).
(REV 1-26-15) (FA 1-29-15)

SECTION 334
SUPERPAVE ASPHALT FOR LAP (OFF-SYSTEM)

334-1 Description.

334-1.1 General: Construct a Superpave asphalt pavement (consisting of either Hot Mix Asphalt (HMA) or Warm Mix Asphalt (WMA)) based on the type of work specified in the Contract and the Asphalt Work Categories as defined below. Meet the applicable requirements for plants, equipment, and construction requirements as defined below. Use an asphalt mix, either HMA or WMA, which meets the requirements of this specification.

334-1.2 Asphalt Work Mix Categories: Construction of asphalt pavement will fall into one of the following work categories:

334-1.2.1 Asphalt Work Category 1: Includes the construction of shared use paths and miscellaneous asphalt.

334-1.2.2 Asphalt Work Category 2: Includes the construction of new asphalt turn lanes, paved shoulders and other non-mainline pavement locations.

334-1.2.3 Asphalt Work Category 3: Includes the construction of new mainline asphalt pavement lanes, milling and resurfacing.

334-1.3 Mix Types: Use the appropriate asphalt mix as shown in Table 334-1.

Table 334-1
Asphalt Mix Types

Asphalt Work Category	Mix Types	Traffic Level	ESALs (millions)
1	Type SP-9.5	A	<0.3
2	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	B	0.3 to <3
3	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	C	≥3

A Type SP or FC mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no additional cost (i.e. Traffic Level B may be substituted for Traffic Level A, etc.). Traffic levels are as defined in Section 334 of the Florida Department of Transportation's (FDOT's) Specifications.

334-1.4 Gradation Classification: The Superpave mixes are classified as fine and are defined in 334-3.2.2. The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5, FC-9.5 ..... 9.5 mm

Type SP-12.5, FC-12.5 ..... 12.5 mm

334-1.5 Thickness: The total pavement thickness of the asphalt pavement will be based on a specified spread rate or plan thickness as shown in the Contract Documents. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness. When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:

$$\text{Spread rate (lbs/yd}^2) = t \times G_{mm} \times 43.3$$

where: t = Thickness (in.) (Plan thickness or individual layer thickness)
G_{mm} = Maximum specific gravity from the mix design

For target purposes only, spread rate calculations shall be rounded to the nearest whole number.

334-1.5.1 Layer Thicknesses: Unless otherwise called for in the Contract Documents, the allowable layer thicknesses for asphalt mixtures are as follows:

Type SP-9.5, FC-9.5 .....3/4 to 1-1/2 inches
Type SP-12.5, FC-12.5 ..... 1-1/2 to 2-1/2 inches

334-1.5.2 Additional Requirements: The following requirements also apply to asphalt mixtures:

1. When construction includes the paving of adjacent shoulders (less than or equal to 5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Contract Documents.

2. For overbuild layers, use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness will be as specified below, unless called for differently in the Contract Documents.

Type SP-9.5……3/8 to 2 inches
Type SP-12.5……..1/2 to 3 inches

3. Variable thickness overbuild layers may be tapered to zero thickness provided the contract documents require a minimum of 1-1/2 inches of mix placed over the variable thickness overbuild layer.

334-1.6 Weight of Mixture: The weight of the mixture shall be determined as provided in 320-3.2 of the FDOT Specifications.

334-2 Materials.

334-2.1 Superpave Asphalt Binder: Unless specified elsewhere in the Contract or in 334-2.3.3, use a PG 67-22 asphalt binder from the FDOT's Approved Products List (APL). If the Contract calls for an alternative asphalt binder, meet the requirements of FDOT Specifications Section 336 or 916, as appropriate.

334-2.2 Aggregate: Use aggregate capable of producing a quality pavement.

For Type FC mixes, use an aggregate blend that consists of crushed granite, crushed Oolitic limestone, other crushed materials (as approved by FDOT for friction courses per Rule 14-103.005, Florida Administrative Code), or a combination of the above. Crushed

limestone from the Oolitic formation may be used if it contains a minimum of 12% silica material as determined by FDOT Test Method FM 5-510 and FDOT grants approval of the source prior to its use. As an exception, mixes that contain a minimum of 60% crushed granite may either contain:

1. Up to 40% fine aggregate from other sources; or,
2. A combination of up to 20% RAP and the remaining fine aggregate from other sources.

A list of aggregates approved for use in friction courses may be available on the FDOT's State Materials Office website. The URL for obtaining this information, if available, is: ftp://ftp.dot.state.fl.us/fdot/smo/website/sources/frictioncourse.pdf.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material:

334-2.3.1 General requirements: RAP may be used as a component of the asphalt mixture, provided the RAP meets the following requirements:

1.When using a PG 76-22 (PMA), or PG 76-22 (ARB) asphalt binder, limit the amount of RAP material used in the mix to a maximum of 20% by weight of total aggregate. As an exception, amounts greater than 20% RAP by weight of total aggregate can be used if no more than 20% by weight of total asphalt binder comes from the RAP material.

2. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.

3. Provide RAP material having a minimum average asphalt binder content of 4.0% by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5% by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of the RAP retained on the No. 4 sieve. The Engineer may sample the stockpile to verify that this requirement is met.

4. Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycle mixture. If oversized RAP material appears in the completed recycle mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not immediately taken, stop plant operations.

334-2.3.2 Material Characterization: Assume responsibility for establishing the asphalt binder content, gradation, and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material.

334-2.3.3 Asphalt Binder for Mixes with RAP: Select the appropriate asphalt binder grade based on Table 334-2. The Engineer reserves the right to change the asphalt binder type and grade during production based on characteristics of the RAP asphalt binder.

Table 334-2
Asphalt Binder Grade for Mixes Containing RAP

Percent RAP	Asphalt Binder Grade
0 - 15	PG 67-22
16 – 30	PG 58-22
> 30	PG 52-28

334-3 Composition of Mixture.

334-3.1 General: Compose the asphalt mixture using a combination of aggregates, mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design:

334-3.2.1 General: Design the asphalt mixture in accordance with AASHTO R 35-12, except as noted herein. Submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. Prior to the production of any asphalt mixture, obtain the Engineer's conditional approval of the mix design. If required by the Engineer, send representative samples of all component materials, including asphalt binder to a laboratory designated by the Engineer for verification. As an exception to these requirements, use a currently approved FDOT Mix Design.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, is:
http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and at his discretion, the Engineer may no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements: Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M 323-12, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification: Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-12, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-12, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point.

334-3.2.3 Gyratory Compaction: Compact the design mixture in accordance with AASHTO T312-12, with the following exceptions: use the number of gyrations at N_{design} as designed in Table 334-3.

Table 334-3
Gyratory Compaction Requirements

Traffic Level	N_{design} Number of Gyrations
A	50
B	65
C	75

334-3.2.4 Design Criteria: Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-12, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-12, Table 6. $N_{initial}$ and $N_{maximum}$ requirements are not applicable.

334-3.2.5 Moisture Susceptibility: Test 4 inch specimens in accordance with FDOT Test Method FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 pounds per square inch. If necessary, add a liquid anti-stripping agent from the FDOT's APL or hydrated lime in order to meet these criteria.

In lieu of moisture susceptibility testing, add a liquid anti-stripping agent from the FDOT's APL. Add 0.5% liquid anti-stripping agent by weight of asphalt binder.

334-3.2.6 Additional Information: In addition to the requirements listed above, provide the following information on each mix design:

1. The design traffic level and the design number of gyrations (N_{design}).
2. The source and description of the materials to be used.
3. The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source (if required).
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature). Do not exceed a target temperature of 330°F for PG 76-22 (PMA) and PG 76-22 (ARB) asphalt binders, and 315°F for unmodified asphalt binders.
9. Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.
10. The name of the mix designer.
11. The ignition oven calibration factor.
12. The warm mix technology, if used.

334-4 Process Control.

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway to control the process.

334-5 General Construction Requirements.

334-5.1 Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the paving operations.

334-5.2 Limitations of Paving Operations:

334-5.2.1 General: Spread the mixture only when the surface upon which it is to be placed has been previously prepared, is intact, firm, dry, clean, and the tack, with acceptable

spread rate, is properly broken. Ensure all granular base materials are properly primed and all asphalt base materials are properly tacked, prior to paving.

334-5.2.2 Air Temperature: Place the mixture only when the air temperature in the shade and away from the artificial heat meets the requirements of Table 334-4. The minimum ambient temperature requirement may be reduced by 5°F when using a warm mix technology, if mutually agreed to by both the Engineer and the Contractor. Table 334-4 Ambient Air Temperature Requirements for Paving

Layer Thickness or Asphalt Binder Type	Minimum Temperature (°F)
≤1 inch	50
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation ≥ 76°C	45
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation < 76°C	40

334-5.3 Mix Temperature: Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the roadway, within a range of plus or minus 30ºF from the target temperature as shown on the mix design. Reject all loads outside of this range. For warm mix asphalt, the Contractor may produce the first five loads of the production day and at other times when approved by the Engineer, at a hot mix asphalt temperature not to exceed 330°F for purposes of heating the asphalt paver. For these situations, the upper tolerance of +30°F does not apply.

334-5.4 Transportation of the Mixture: Transport the mix in trucks of tight construction, which prevents the loss of material and the excessive loss of heat and previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use a release agent that will contaminate, degrade, or alter the characteristics of the asphalt mix or is hazardous or detrimental to the environment. Petroleum derivatives (such as diesel fuel), solvents, and any product that dissolves asphalt are prohibited. Provide each truck with a tarpaulin or other waterproof cover mounted in such a manner that it can cover the entire load when required. When in place, overlap the waterproof cover on all sides so it can be tied down. Cover each load during cool and cloudy weather and at any time it appears rain is likely during transit with a tarpaulin or waterproof cover. Cover and tie down all loads of friction course mixtures.

334-5.5 Preparation of Surfaces Prior to Paving:

334-5.5.1 Cleaning: Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

334-5.5.2 Patching and Leveling Courses: As shown in the plans, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.

334-5.5.3 Application over Surface Treatment: Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.

334-5.5.4 Tack Coat: Use a rate of application as defined in Table 334-5. Control the rate of application to be within plus or minus 0.01 gallon per square yard of the target application rate. The target application rate may be adjusted by the Engineer to meet specific field conditions. Determine the rate of application as needed to control the operation. When using PG 52-28, multiply the target rate of application by 0.6.

Table 334-5 Tack Coat Application Rates		
Asphalt Mixture Type	Underlying Pavement Surface	Target Tack Rate (gal/yd^2)
Base Course, Structural Course, Dense Graded Friction Course	Newly Constructed Asphalt Layers	0.03 minimum
	Milled Surface or Oxidized and Cracked Pavement	0.06
	Concrete Pavement	0.08

334-5.6 Placing Mixture:

334-5.6.1 Alignment of Edges: With the exception of pavements placed adjacent to curb and gutter or other true edges, place all pavements by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than plus or minus 1.5 inches from the stringline.

334-5.6.2 Rain and Surface Conditions: Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 334-5.3, the Contractor may then place the mixture caught in transit.

334-5.6.3 Checking Depth of Layer: Check the depth of each layer at frequent intervals to ensure a uniform spread rate that will meet the requirements of the Contract.

334-5.6.4 Hand Work: In limited areas where the use of the spreader is impossible or impracticable, spread and finish the mixture by hand.

334-5.6.5 Spreading and Finishing: Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

334-5.6.6 Thickness Control: Ensure the spread rate is within 10% of the target spread rate, as indicated in the Contract. When calculating the spread rate, use, at a minimum, an average of five truckloads of mix. When the average spread rate is beyond plus or minus 10% of the target spread rate, monitor the thickness of the pavement layer closely and adjust the construction operations.

If the Contractor fails to maintain an average spread rate within plus or minus 10% of the target spread rate for two consecutive days, the Engineer may elect to stop the construction operation at any time until the issue is resolved.

When the average spread rate for the total structural or friction course pavement thickness exceeds the target spread rate by plus or minus50 pounds per square yard for layers greater than or equal to 2.5 inches or exceeds the target spread rate by plus or minus 25 pounds per square yard for layers less than 2.5 inches, address the unacceptable pavement in accordance with 334-5.10.4, unless an alternative approach is agreed upon by the Engineer.

334-5.7 Leveling Courses:

334-5.7.1 Patching Depressions: Before spreading any leveling course, fill all depressions in the existing surface as shown in the plans.

334-5.7.2 Spreading Leveling Courses: Place all courses of leveling with an asphalt paver or by the use of two motor graders, one being equipped with a spreader box. Other types of leveling devices may be used upon approval by the Engineer.

334-5.7.3 Rate of Application: When using Type SP-9.5for leveling, do not allow the average spread of a layer to be less than 50 pounds per square yard or more than 75 pounds per square yard. The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

334-5.8 Compaction: For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

When density testing for acceptance is required, select equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When density testing for acceptance is not required, use a rolling pattern approved by the Engineer.

Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

334-5.9 Joints.

334-5.9.1 Transverse Joints: Construct smooth transverse joints, which are within 3/16 inch of a true longitudinal profile when measured with a 15 foot manual straightedge meeting the requirements of FDOT Test Method FM 5-509. These requirements are waived for transverse joints at the beginning and end of the project and at the beginning and end of bridge structures, if the deficiencies are caused by factors beyond the control of the Contractor such as no milling requirement, as determined by the Engineer. When smoothness requirements are waived, construct a reasonably smooth transitional joint.

334-5.9.2 Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Do not construct longitudinal joints in the wheel paths. The Engineer may waive these requirements where offsetting is not feasible due to the sequence of construction.

334-5.10 Surface Requirements: Construct a smooth pavement with good surface texture and the proper cross slope.

334-5.10.1 Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with 334-5.10.4.

In areas not defined to be a density testing exception per 334-6.4.1, obtain for the Engineer, three 6 inch diameter roadway cores at locations visually identified by the Engineer to be segregated. The Engineer will determine the density of each core in accordance with FDOT

Test Method FM 1-T 166 and calculate the percent G_{mm} of the segregated area using the average G_{mb} of the roadway cores and the representative PC G_{mm} for the questionable material. If the average percent G_{mm} is less than 90.0, address the segregated area in accordance with 334-5.10.4.

334-5.10.2 Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents.

334-5.10.3 Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FDOT Test Method FM 5-509.

334-5.10.3.1 Straightedge Testing:

334-5.10.3.1.1 Acceptance Testing: Perform straightedge testing in the outside wheel path of each lane for the final (top) layer of the pavement. Test all pavement lanes where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

334-5.10.3.1.2 Final (Top) Pavement Layer: At the completion of all paving operations, straightedge the final (top) layer either behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 3/16 inch in accordance with 334-5.10.4, unless waived by the Engineer. Retest all corrected areas.

334-5.10.3.1.3 Straightedge Exceptions: Straightedge testing will not be required in the following areas: shoulders, intersections, tapers, crossovers, sidewalks, shared use paths, parking lots and similar areas, or in the following areas when they are less than 250 feet in length: turn lanes, acceleration/deceleration lanes and side streets. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. In the event the Engineer identifies a surface irregularity in the above areas that is determined to be objectionable, straightedge and address all deficiencies in excess of 3/8 inch in accordance with 334-5.10.4.

334-5.10.4 Correcting Unacceptable Pavement: Correct deficiencies in the pavement layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on both sides (where possible) of the defective area for the full width of the paving lane, at no additional cost.

334-6 Acceptance of the Mixture.

334-6.1 General: The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

1. Asphalt Work Category 1 – Certification by the Contractor as defined in 334-6.2.
2. Asphalt Work Category 2 – Certification and process control testing by the Contractor as defined in 334-6.3.
3. Asphalt Work Category 3 – Process control testing by the Contractor and acceptance testing by the Engineer as defined in 334-6.4.

334-6.2 Certification by the Contractor: On Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications. The Engineer may run independent tests to determine the acceptability of the material.

334-6.3 Certification and Process Control Testing by the Contractor: On Asphalt Work Category 2 construction, submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications, along with supporting test data documenting all process control testing as described in 334-6.3.1. If required by the Contract, utilize an Independent Laboratory as approved by the Engineer for the process control testing. The mix will also require visual acceptance by the Engineer. In addition, the Engineer may run independent tests to determine the acceptability of the material. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

334-6.3.1 Process Control Sampling and Testing Requirements: Perform process control testing at a frequency of once per day. Obtain the samples in accordance with FDOT Method FM 1-T 168. Test the mixture at the plant for gradation (P_{-8} and P_{-200}) and asphalt binder content (P_b). Measure the roadway density with 6 inch diameter roadway cores at a minimum frequency of once per 1,500 feet of pavement with a minimum of three cores per day.

Determine the asphalt binder content of the mixture in accordance with FDOT Method FM 5-563. Determine the gradation of the recovered aggregate in accordance with FDOT Method FM 1-T 030. Determine the roadway density in accordance with FDOT Method FM 1-T 166. The minimum roadway density will be based on the percent of the maximum specific gravity (Gmm) from the approved mix design. If the Contractor or Engineer suspects that the mix design Gmm is no longer representative of the asphalt mixture being produced, then a new Gmm value will be determined from plant-produced mix, in accordance with FDOT Method FM 1-T 209, with the approval of the Engineer. Roadway density testing will not be required in certain situations as described in 334-6.4.1. Assure that the asphalt binder content, gradation and density test results meet the criteria in Table 334-4.

Table 334-4
Process Control and Acceptance Values

Characteristic	Tolerance
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 8 Sieve (percent)	Target ± 6.00
Passing No. 200 Sieve (percent)	Target ± 2.00
Roadway Density (daily average)	Minimum 90.0% of Gmm

334-6.4 Process Control Testing by the Contractor and Acceptance Testing by the Engineer: On Asphalt Work Category 3, perform process control testing as described in 334-6.3.1. In addition, the Engineer will accept the mixture at the plant with respect to gradation (P_{-8} and P_{-200}) and asphalt binder content (P_b). The mixture will be accepted on the roadway with respect to density. The Engineer will sample and test the material as described in 334-6.3.1. The Engineer will randomly obtain at least one set of samples per day. Assure that the asphalt content, gradation and density test results meet the criteria in Table 334-4. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the

questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

334-6.4.1 Acceptance Testing Exceptions: When the total quantity of any mix type in the project is less than 500 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may run independent tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, variable thickness overbuild courses, leveling courses, any asphalt layer placed on subgrade (regardless of type), miscellaneous asphalt pavement, shared use paths, crossovers, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 pounds per square yard. Density testing for acceptance will not be performed on asphalt courses placed on bridge decks or approach slabs; compact these courses in static mode only. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet continuous in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes, or ramps. Density testing for acceptance will not be performed in intersections. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. Compact these courses in accordance with a standard rolling procedure approved by the Engineer. In the event that the rolling procedure deviates from the approved procedure, placement of the mix will be stopped.

334-7 Method of Measurement.

For the work specified under this Section, the quantity to be paid for will be the weight of the mixture, in tons.

The bid price for the asphalt mix will include the cost of the liquid asphalt and the tack coat application as specified in 334-5.5.4. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

334-8 Basis of Payment.

334-8.1 General: Price and payment will be full compensation for all the work specified under this Section.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

LAP CERTIFICATION OF CURRENT CAPACITY

CONFIDENTIAL

For bids to be received on _____
(Letting Date)

Fill in your FDOT Vendor Number

VF __ __ __ __ __ __ __ __ __ __ __ __ __

(Only applicable to FDOT pre-qualified contractors)

CERTIFICATE

I hereby certify that the amount of any proposal submitted by this bidder for the above letting does not exceed the amount of the Firm's CURRENT CAPACITY (maximum capacity rating less total uncompleted work).

The total uncompleted work as shown on
the "Status of Contracts on Hand" report (page 2) $ _____

I further certify that the "Status of Contracts on Hand" report (page 2) was prepared as follows:

1. If the letting is before the 25th day of the month, the certificate and report reflect the uncompleted work as of the 15th day of the month, last preceding the month of the letting.

2. If the letting is after the 25th day of the month, the certificate and report reflects the uncompleted work in progress as of the 15th day of the month of the letting.

3. All new contracts (and subcontracts) awarded earlier than five days before the letting date are included in the report and charged against our total rating.

I certify that the information above is correct.

_____
NAME OF FIRM

Sworn to and subscribed this _____ day
of _____, 20 _____

By: _____

_____
Title

STATUS OF CONTRACTS ON HAND

(Furnish complete information about all your contracts, whether prime or subcontracts; whether in progress or awarded, but not yet begun; and regardless of whom contracted with.)

1	2	3	4	5	6
PROJECTS OWNER, LOCATION AND DESCRIPTION	CONTRACT (OR SUBCONTRACT) AMOUNT	AMOUNT SUBLET TO OTHERS	BALANCE OF CONTRACT AMOUNT	UNCOMPLETED AMOUNT TO BE DONE BY YOU	
				AS PRIME CONTRACTOR	AS SUBCONTRACTOR
NOTE: Columns 2 and 3 to show total contract (or subcontract) amounts. Column 4 to be difference between columns 2 and 3. Amount in columns 5 or 6 to be uncompleted portion of amount in column 4. All amounts to be shown to nearest $100. The Contractor may consolidate and list as a single item all contracts which, individually, do not exceed 3% of total, and which, in the aggregate, amount to less than 20% of the total.			TOTALS	$0.00	$0.00
			TOTAL UNCOMPLETED WORK ON HAND TO BE DONE BY YOU (TOTAL COLUMNS 5 AND 6)	$0.00	

Article 4. CONTRACT PRICES

4.1 OWNER shall pay CONTRACTOR for complettion of the work in accordance with the Contract Documents in the current funds as follows:

SCHEDULE OF BID PRICES

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
GENERAL CONDITIONS						
1	Site Mobilization	LS	1	_____ Dollars _____ Cents	$ _____	$ _____
2	Maintenance of Traffic	LS	1	_____ Dollars _____ Cents	$ _____	$ _____
3	As-Built Record Drawings	LS	1	_____ Dollars _____ Cents	$ _____	$ _____
4	NPDES Permit	LS	1	_____ Dollars _____ Cents	$ _____	$ _____
5	Erosion Control	LS	1	_____ Dollars _____ Cents	$ _____	$ _____

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
6	Indemnification	LS	1	Ten Dollars Zero Cents	$ 10.00	$ 10.00
7	Project Identification Signs	EA	2	Dollars Cents	$	$
8	Photo Documentation/Historic Photo Inventory	LS	1	Dollars Cents	$	$
9	Unforeseen Condition Allowance	LS	1	Fifty-five thousand Dollars Zero Cents	$ 55,000.00	$ 55,000.00
10	Video Allowance	LS	1	Three thousand Dollars Zero Cents	$ 3,000.00	$ 3,000.00
DEMOLITION						
11	Clearing and Grubbing	LS	1	Dollars Cents	$	$
12	6" Thick Driveway Apron Removal	SY	320	Dollars Cents	$	$

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
13	Pavement Removal	SY	1,350	Dollars Cents	$	$
ROADWAY						
14	1" Milling and Resurfacing	SY	4,800	Dollars Cents	$	$
15	Variable Milling and Resurfacing 2" Max	LS	1	Dollars Cents	$	$
16	8" Compacted Limerock Base Incl. Prime Coat	SY	1,428	Dollars Cents	$	$
17	1.5" Type SP 9.5 Asphalt Surface Course 2-0.75" lifts Incl. Tack Coat	SY	1,263	Dollars Cents	$	$
18	12" Compacted Subgrade	SY	1,628	Dollars Cents	$	$
19	Colored Asphalt Coating	SY	1,110	Dollars Cents	$	$

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
20	Type "F" Curb	LF	975	Dollars Cents	$	$
21	Valley Curb	LF	300	Dollars Cents	$	$
22	4" Thick Concrete Sidewalk	LF	812	Dollars Cents	$	$
23	6" Thick Concrete Sidewalk	LF	375	Dollars Cents	$	$
24	6" Thick Concrete Driveway Apron	SF	315	Dollars Cents	$	$
25	Curb Ramps with Tactile Surface Pavers	SY	368	Dollars Cents	$	$
26	Swale Grading and Sodding	SY	1,300	Dollars Cents	$	$
27	Pedestrian Signal, LED, Countdown, 1 Direction "Complete"	EA	7	Dollars Cents	$	$

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
28	Stop Conditions/Striped Crosswalks/Pavement Markings Traffic Signage at Intersections	LS	1	Dollars Cents	$	$
29	Irrigation Modification (George Bush Blvd & NE 2nd Avenue)	LS	1	Dollars Cents	$	$
	TOTAL EVALUATED BASE BID BID ITEMS 1 through 29 (in numbers)			Dollars Cents		
ADD ALTERNATE 30	**DECORATIVE PAVER BRICK CROSSWALKS**					
30.1	Brick Pavers	SY	400	Dollars Cents	$	$
30.2	12" Header Curb	SY	960	Dollars Cents	$	$
30.3	Pavement Removal (DEDUCTION)	SY	400	Dollars Cents	$	$

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
30.4	1" Milling and Resurfacing (DEDUCTION)	SY	540	Dollars Cents	$	$
30.5	8" Compacted Limerock Base (DEDUCTION) Incl. Prime Coat	SY	400	Dollars Cents	$	$
30.6	1.5" Type SP 9.5 Asphalt Surface Course (DEDUCTION) 2-0.75" lifts Incl. Tack Coat	SY	400	Dollars Cents	$	$
30.7	12" Compacted Subgrade (DEDUCTION)	SY	400	Dollars Cents	$	$
	TOTAL EVALUATED ADD ALTERNATE BID ITEM 30 (in numbers)			Dollars Cents		

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
31	**SIDEWALK REMOVAL AND REPLACEMENT**					
31.1	4" Thick Sidewalk Removal	SY	1,620	Dollars Cents	$	$
31.2	6" Thick Sidewalk Removal	SY	375	Dollars Cents	$	$
31.3	4" Thick Concrete Sidewalk	SY	1,620	Dollars Cents	$	$
31.4	6" Thick Concrete Sidewalk	SY	375	Dollars Cents	$	$
	TOTAL EVALUATED ADD ALTERNATE BID ITEM 31 (in numbers)			Dollars Cents		$

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE (in words)	UNIT PRICE	EXTENDED TOTAL PRICE
32	**ASPHALT RUBBER MEMBRANE INTERLAYER (ARMI)**					
32.1	2.5" Milling	SY	5,800	Dollars Cents	$	$
32.2	ARMI Layer Incl. No. 6 Aggregate	SY	5,800	Dollars Cents	$	$
32.3	1.5" Type SP 9.5 Asphalt Surface Course	SY	5,800	Dollars Cents	$	$
32.4	1" Milling and Resurfacing (DEDUCTION)	SY	5,800	Dollars Cents	$	$
	TOTAL EVALUATED ADD ALTERNATE BID ITEM 32 (in numbers)					$
				Dollars Cents		

(Amounts are to be shown in both words and figures. In case of discrepancies, the amount shown in words will govern for each bid item, unit price, and total bid. Extended unit price shall prevail over total price for bid items based upon unit price.)